PIT AND QUARRY

Panorama of the Plant Operated by Rhodes-Priestly in Pine Canyon near Tenney, Wash.

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Stand-Up Stamina

SUSTAINED EARNING POWER–*that's Mack*

• Wherever there's earth or rock to be moved...wherever there's need for *extra* performance, *extra* stamina, *extra* dependability–there you'll find a job that's made to order for a Mack.

Mack's proved superiority in earth moving work rests on *built-in superiority* of design and construction. In addition to their inherent power, strength and durability, Mack trucks bring you outstanding advances in maneuverability, ease of control, positive traction and maintenance accessibility.

Follow the lead of profit-wise operators who have discovered from actual experience that when it comes to working harder, lasting longer and operating at lowest cost–there's nothing to equal a Mack. Your nearest Mack branch or distributor will give you the full story on what Mack's *sustained earning power* can mean to you in greater profits through greater output at lower cost.

Be Profit-Wise

Modernize with

Mack
TRUCKS

8416

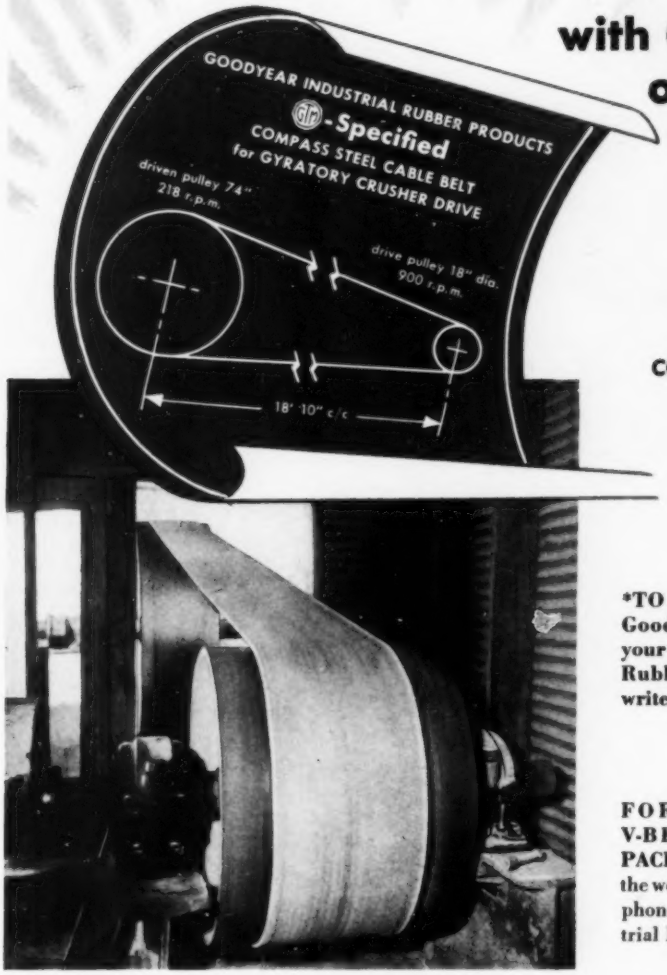
...outlast them all

Mack Motor Truck Corporation, Empire State Building, New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

Texas quarry reports

Triple Service plus!

with COMPASS Belt on Crusher



Best Previous Belt Life
One Year

COMPASS Steel Cable Belt—
G.T.M.-Specified*
Served 3¾ Years
to date and still
going strong

***TO CONSULT THE G. T. M.—Goodyear Technical Man—phone your nearest Goodyear Industrial Rubber Products Distributor or write Goodyear, Akron 16, Ohio.**

FOR HOSE, FLAT BELTS, V-BELTS, MOLDED GOODS, PACKING, TANK LINING built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor.

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

GOODYEAR

THE GREATEST NAME IN RUBBER

Compass—T.M.
The Goodyear Tire & Rubber Company

PIT AND QUARRY, November, 1950, Vol. 43, No. 5. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago 5, Ill. Subscription price $3 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $3 additional for each year. Single copy 25 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1879.

...snap judgment

This frontier sheriff *had* to be quick on the draw—action *preceded* thought! Careful buyers today give more than snap judgment in the purchase of their bags . . . bags which vitally affect the acceptance and sale of their goods.

Give time to this important subject. Be sure you get the container that protects your product, that gives good display to your brand name, that is specifically designed for your product. Your Chase Salesman is an expert with a broad technical background. He is eager to work with you. Why not consult him today?

bags for all industry and agriculture...

- cotton bags of all kinds
- Topmill burlap bags
- paper and Multiwall bags
- Saxolin open mesh bags
- combination bags, liners and specialties

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BOISE • DALLAS • TOLEDO • DENVER • DETROIT • MEMPHIS • BUFFALO • ST. LOUIS • NEW YORK • CLEVELAND • MILWAUKEE
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EASTON'S NEW TP QUARRY TRAILER

The Greatest Side-Dump ever built!

- TP-1114 • CAPACITY 14 TONS
- TP-1317 • CAPACITY 17 TONS
- TP-1520 • CAPACITY 20 TONS

13% INCREASE IN WATER LEVEL CAPACITY

—with no increase in overall dimensions!

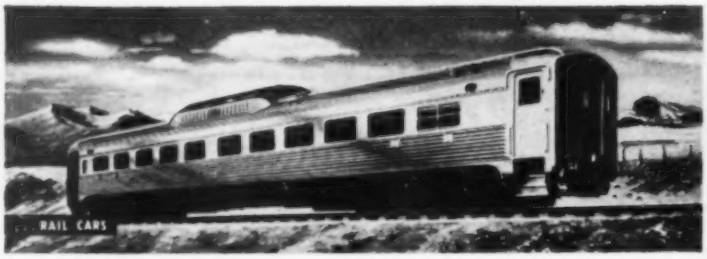
It's the brand new EASTON TP doorless, reversible, two-way side-dump quarry trailer! EASTON Trailers have long been renowned for their rugged, durable quality. Now, all-welded, with several innovations in construction and reinforcement, they're sturdier than ever! Always outstanding as a big payloader, the improved TP body design now adds 13% more capacity with no increase in dimensions. Three years of intensive engineering and experiment have been expended on the TP program to give quarry men the greatest side-dump we have ever built. Redesigned from the ground up, employing the new EASTON E-Series axles, featuring wide base rims; larger diameter and wider air powered brakes; heavy-duty, slipper-shoe-mounted springs; and improved load distribution, the new EASTON TP's offer faster, more efficient haulage than ever before. Investigate now! EASTON engineers will be pleased to consult with you toward improved quarry transportation.

EASTON TP TRAILERS may be used in combination with any well-known make of truck-tractor. Designed for fixed-point dumping either by EASTON automatic electric overhead hoist or hydraulic body hoist. EASTON BP Bodies of the same design, same capacities, are available for chassis mounting.

EASTON CAR & CONSTRUCTION CO. • EASTON, PA.

EASTON

CARS • TRUCK BODIES • TRAILERS



This is the Diesel

that speeds the big jobs

HERE IT IS—the newest member of the General Motors Diesel family—the brawny 6-110 engine that develops 275 horsepower.

It is 50% more powerful than the famous 6-cylinder GM "71" engine that powers so many trucks, buses, boats, construction equipment and other mobile, portable and stationary units.

This rugged new Diesel doesn't care what's tied to its tail. It has power to spare to keep big jobs humming, yet is so compact it doesn't hog space.

For example, each new Budd RDC rail car is driven by a pair of 6-110 Diesels with GM torque converter transmissions. The compactness of these power plants permits mounting them under the floor so that no revenue space is lost. These rail cars accelerate from standstill to 44 miles per hour in just one minute and have a top speed of 83 mph with a full load.

Like all other GM Diesel engines the 6-110 is two-cycle—delivers power on every piston downstroke. This advanced design cuts down Diesel size without sacrificing ruggedness; it insures fuel economy, lower maintenance costs, exceptional dependability and long life.

The GM 6-110 engine provides Diesel power at its best for heavy-duty jobs—not only for rail cars but in the largest mountain-type trucks, huge rock crushers, deep-sea fishing and pleasure boats, big pumps and compressors, mining and oil field equipment. *It is an exceptionally compact Diesel for its horsepower—an engine that gives remarkably fine performance in minimum space.*

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES . . . Up TO 275 H. P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS . . . Up TO 800 H. P.

GENERAL MOTORS

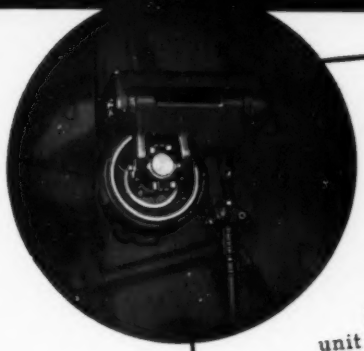
Hear HENRY J. TAYLOR on the air every Monday evening over the ABC Network, coast to coast.

GM
GENERAL MOTORS
DIESEL POWER

Only GM Diesels provide all these advantages

Compact size—less weight per horsepower . Two-cycle smoothness, power on every downstroke . Quick starting, on its own fuel . Unit injectors—no high-pressure fuel lines . Rapid acceleration . Cleaner burning . Better high-altitude performance . Easy accessibility.

"Your Key to Power Economy"



This is all there is to the "Feather-Touch" Clutch Control. No valves or tubing. Nothing affected by temperature. Nothing to refill.

Ease of Control means MONEY!

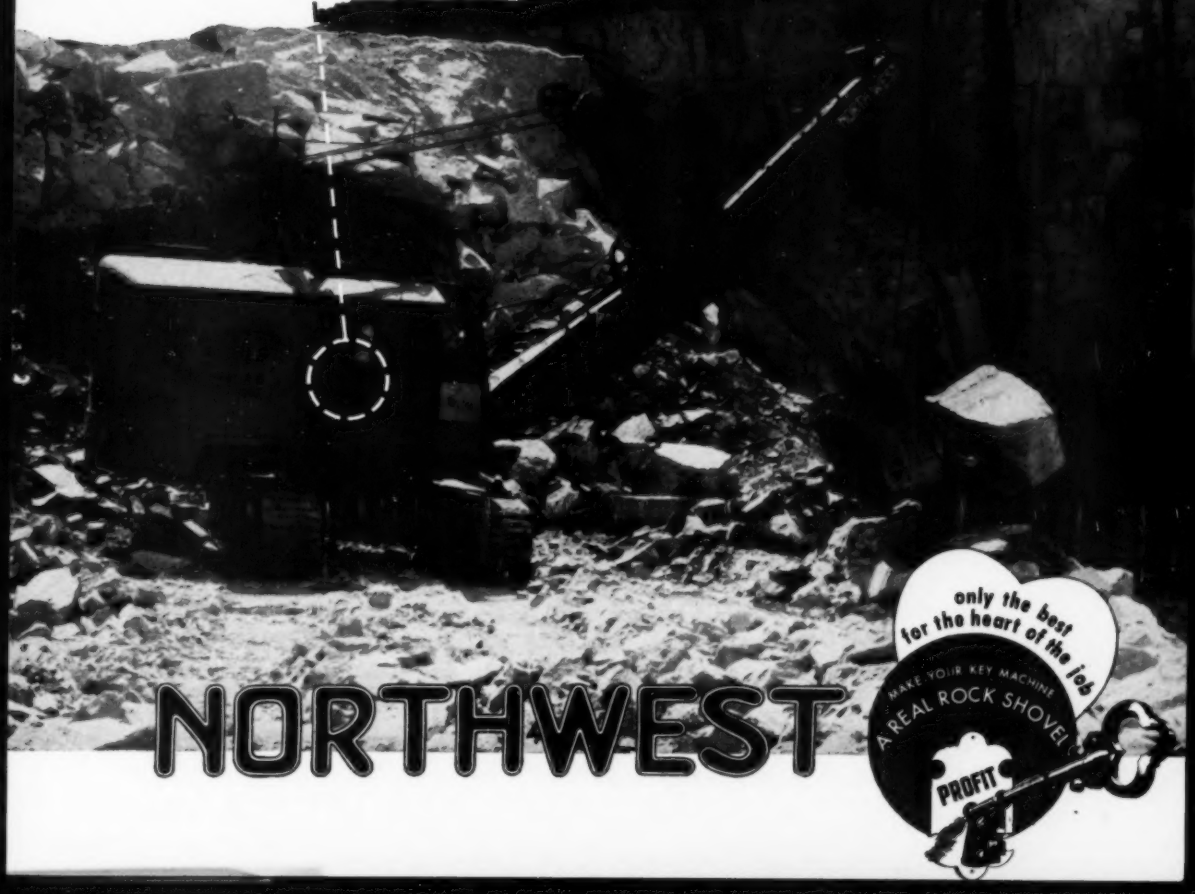
Easy control means faster operation and higher output per unit of time and it means a higher output curve as the day progresses because it reduces cumulative fatigue.

The Northwest brings you the "Feather-Touch" Clutch Control—a simple *mechanical* device that throws heavy drum clutches through the power of the engine. There are no pipes, no pumps, no valves and nothing to refill. It is not subject to influence by weather or temperature. It brings the operator the "feel of the load" at all times. Release is positive and your machine *cannot be shut down by control failure.*

In conjunction with the Northwest Dual Independent Crowd, that utilizes force other independent crowd shovels waste, it makes the rock jobs easier and assures greater output.

It is just another of the many Northwest advantages that make the Northwest a real Rock Shovel. You can't afford anything but the best for the *Key Spots* at the heart of the job. You should know about Northwest advantages. Ask for details and plan ahead. Why not place your order and be sure of a real Rock Shovel?

NORTHWEST ENGINEERING CO.
1515 Field Building, 135 South LaSalle Street, Chicago 3, Illinois



HORSEPOWER WORKS BETTER WHEN IT'S CLEAN!

That's why Delvac Oils give Top Performance in Your Engines

ENGINE EFFICIENCY calls for engine *cleanliness*... and Delvac Oils help keep heavy-duty gasoline and Diesel engines *clean*—promote full power—minimize wear—even under the toughest operating conditions!

Delvac Oils are heavy-duty oils with exceptional detergent-dispersive properties, and unusually high resistance to oxidation. They minimize formation of harmful deposits... effectively guard rings, pistons, cylinders and bearings against wear and corrosion . . . assure more available power.

This means fewer repairs and overhauls—*lower operating and maintenance costs all around!*

For top performance and economy from all your engines, use Delvac Oils—recommended or approved by 111 engine and equipment builders.

Here's Practical Help for Contractors . . .

Socony-Vacuum gives you quality lubricants *plus* . . .

- Help on maintenance problems.
- Individual, tested lubrication schedules.
- Advice on correct application of lubricants, and on proper handling and storing.
- One source of supply, available everywhere.
- Simplified inventory—with . . .

1. **DELVAC OILS**—for all gasoline and automotive-Diesel engines.
2. **MOBILUBE GX**—multi-purpose gear lubricant for all manually operated transmissions, transfer cases and drive axles.
3. **MOBILGREASE**—in grades and types for lubrication of all chassis parts, engine accessories.

SOCONY-VACUUM

DELVAC OILS

Correct Lubrication for Contractors

THE FLYING RED HORSE COMPANIES: SOCONY-VACUUM OIL COMPANY, INC. MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION

THE DEMPSTER-DIGGSTER, Type GRD, same as the one that loaded 600 tons of stone recently, has a 15 foot six inch turning radius, is 20 feet long when bucket is in traveling position, and bottom of bucket is nine feet three inches above ground when in extreme dumping position. It will dig 15 inches below grade and through a 15 foot bank.

THIS DEMPSTER-DIGGSTER, Type HL, is specially equipped for high dumping. The bottom of the bucket is 13 feet six inches above ground. It will dig through an 18 foot bank.

FOR FAST, EFFICIENT operation in difficult terrain, the Dempster-Diggster is available with crawler-type traction.

Fast Automotive Shovel Loads 600 Tons of Stone in Half a Day

CONTRACTOR REPORTS: HYDRAULIC CROWD, HOIST UNIT "FILLS LONG NEEDED PLACE IN OUR INDUSTRY"

THE DEMPSTER-DIGGSTER, a revolutionary shovel loader, recently loaded 600 tons of broken stone in the first half day of operation. This outstanding performance was reported to Dempster Brothers, Inc. by W. E. Lambert, president of Lambert Brothers, Inc., one of the nation's largest crushed stone contracting firms.

"In connection with our extensive activities in several southern states," the contractor said, "we have used various types of power shovels and front end loaders. After seeing the easy operation of the hydraulically operated Diggster in a demonstration we had made alongside of a competing loader, we placed an order with you. We installed the Diggster equipped with a yard and half stockpile bucket on one of our operations in western North Carolina.

"Our records show," he continued, "that the unit loaded approximately 600 tons of broken stone in the first half day of operation. The Diggster has been working continuously and is giving perfect satisfaction. It is a pleasure for us to so advise you because in our opinion the Diggster fills a long needed place in our industry. We welcome you to bring any interested parties to our operation to see the Diggster in action."

The tremendous speed of the Dempster-Diggster in excavation and stockpile work is accounted for, mainly, by its exclusive independent hydraulic crowd and hoist action, the hydraulic steering, and wheel-type traction, which permits truck speeds to and from jobs. The power crowd permits bucket to keep digging until loaded . . . no digging with wheels. The hydraulic steering gives the driver easy, fast, finger-tip control.

Four standard interchangeable buckets of two types are available. Digging buckets with four bottom teeth in 1 and $1\frac{1}{4}$ cubic yard (heaped) capacities; materials handling buckets in $1\frac{1}{2}$ and 2 cubic yard (struck) capacities.

Complete information and prices may be obtained by writing the manufacturer, Dempster Brothers, Inc.

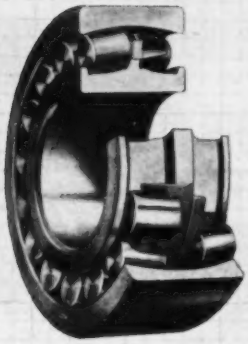
DEMPSTER DIGGSTER

DEMPSTER BROTHERS

2110 N. Knox

Knoxville 17, Tennessee

Pit and Quarry



...help screen stone for profit

Screen Equipment Company SECO vibrating screens are built to deliver large tonnage output with minimum maintenance through the use of Torrington Spherical Roller Bearings.

These self-aligning bearings automatically compensate for shaft deflection, require no alignment adjustments in service, and provide the high capacity needed to handle heavy gyratory loads.

Torrington Spherical Roller Bearings can assist in securing profitable operation of your heavy-duty equipment. Let our engineers help you work out details of design and application.

THE TORRINGTON COMPANY

South Bend 21, Ind. • Torrington, Conn.

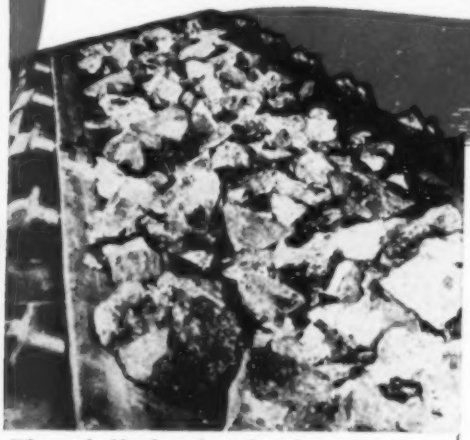
District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON *SPHERICAL ROLLER* **BEARINGS**

SPHERICAL ROLLER • TAPERED ROLLER • STRAIGHT ROLLER • NEEDLE • BALL • NEEDLE ROLLERS

"GUILLOTINE" TEST

Proves 50% MORE CUSHION in *Homocord* CONVEYOR BELTS



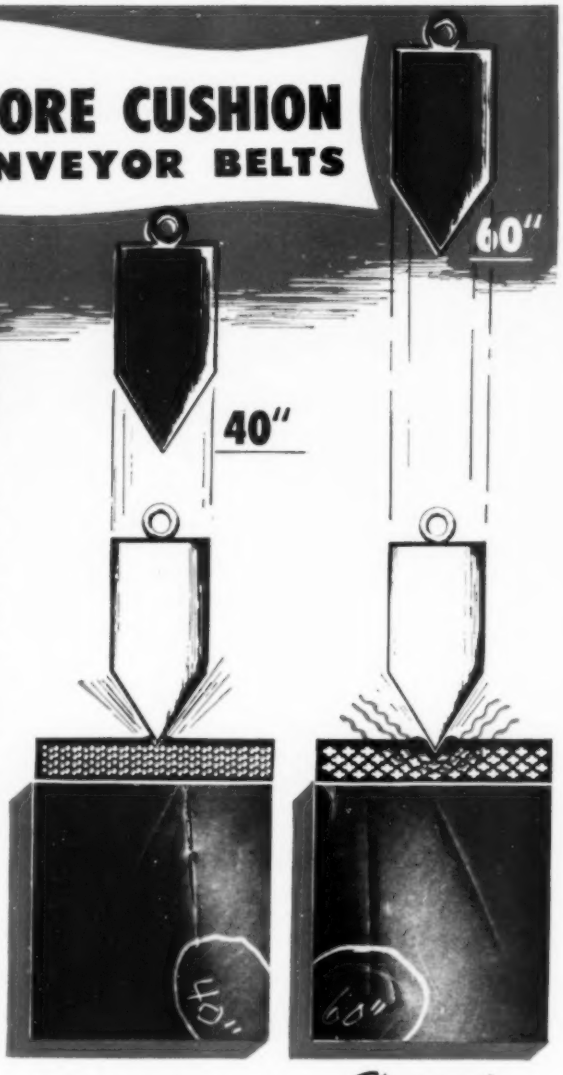
When rocks like those shown here drop on a conveyor belt, every shock at loading point shortens the life of the belt. To overcome this, extreme cushion and resilience are built into Homocord Conveyor Belts. This "Through-and-Through" Cushion gives Homocord Conveyor Belts longer life than any other belt.

To measure comparative cushion and shock-absorbing qualities, Raybestos-Manhattan engineers devised the "killer" test shown at right. A heavy metal weight, ground to a blunt edge is dropped from various measured heights until it ruptures the cover of the sample under test.

Notice the shock lines indicate how a regular conveyor belt's "boardy" resistance to impact leads to cover gouging and breakdown. The shock lines on the Homocord cross section show how "Through-and Through" cushion and resilience of the Homocords absorb impact without injury.

Homocord CUSHIONED CONSTRUCTION HAS 8 ADVANTAGES

1. Complete bonding of every member into a homogeneous structure.
2. Holds metal fasteners, with no loss of draw-bar strength.
3. Lateral flexibility permits perfect troughing, accurate training, reduces fatigue of flexing at bend in troughing idlers.
4. Resists destructive action of continuous or heavy impact feeding.
5. Cushion Homocord body and low inelastic stretch reduce wear and tear of top cover.
6. Homocord body reduces hazard of punctures.
7. The Homocords are completely encased in Flexlastics; moisture not admitted, mildew cannot start.
8. Longer life, lower cost per ton.



REGULAR DUCK BELT

Unretouched photo shows actual rupture results of a 40" Guillotine Drop Test on a conventional 4-ply 32-oz. duck belt with 1/8" top cover, 1/16" bottom cover. With little cushion to absorb impact, the cover ruptures and deterioration sets in.

Homocord

Unretouched photo shows comparable degree of impact effect from a 60" Guillotine Drop Test on a 4-ply AEH Homocord Conveyor Belt with 1/8" top cover and 1/16" bottom cover. Impact of falling weight is dissipated through the Homocords, cushioned in Flexlastics.

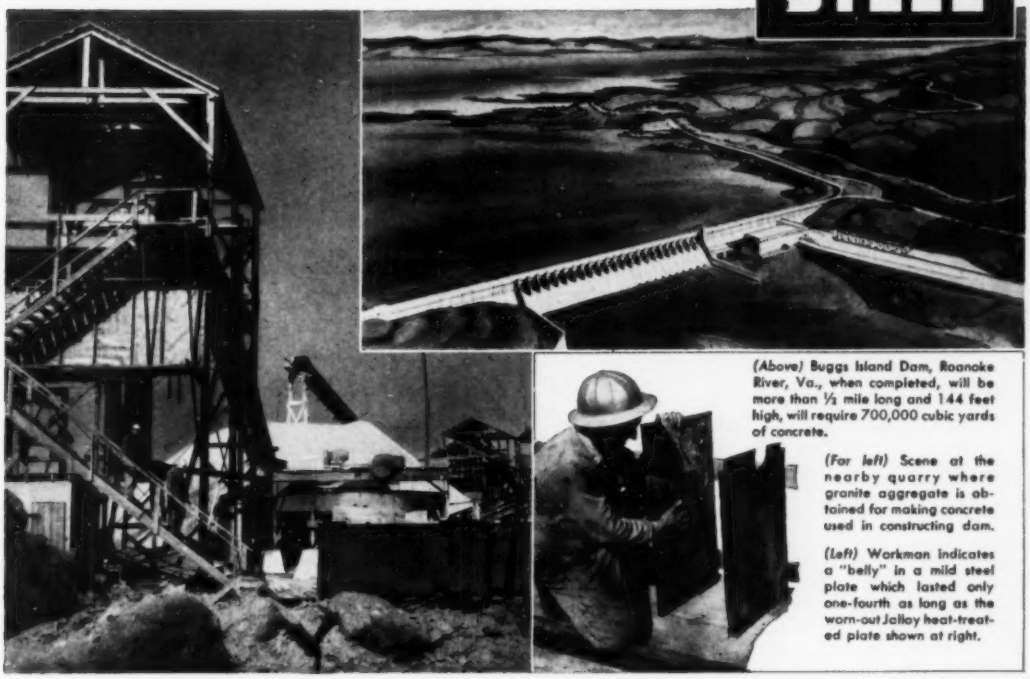
MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Manufacturers of Mechanical Rubber Products • Rubber Covered Equipment • Radiator Hose • Fan Belts • Brake Linings • Brake Blocks • Clutch Facings • Packings • Asbestos Textiles • Powdered Metal Products • Abrasive & Diamond Wheels • Bowling Balls

$12,500 SAVED in construction equipment maintenance with first 45 tons of Heat-treated JALLOY STEEL PLATE

J&L STEEL



(Above) Buggs Island Dam, Roanoke River, Va., when completed, will be more than ½ mile long and 144 feet high, will require 700,000 cubic yards of concrete.

(For left) Scene at the nearby quarry where granite aggregate is obtained for making concrete used in constructing dam.

(Left) Workman indicates a "belly" in a mild steel plate which lasted only one-fourth as long as the worn-out Jalloy heat-treated plate shown at right.

JALLOY Heat-Treated Plate lasts 4 to 5 times as long as mild steel in handling crushed stone for Buggs Island Dam

Buggs Island Dam, across the Roanoke River near South Hill, Va., is being constructed by Department of the Army, Corps of Engineers, Norfolk District. Granite is blasted from a quarry three miles from the dam site and crushed into various sizes. In moving and handling this hard abrasive rock, *worthwhile* savings are being made by using heat-treated JALLOY plate for: Chutes, screening equipment, truck bodies, shovel-dipper teeth and similar materials-handling applications.

At the quarry, operated by Ralph E. Mills and Gorman Bros., Inc., direct comparisons show that heat-treated JALLOY plate lasts an average of 5 times as long as mild steel. During the first 11 months, approximately 25 tons of JALLOY heat-treated plate were installed at the quarry.

At the dam, Jones-Tompkins-Wright, Contractors, installed approximately 20 tons of heat-treated JALLOY plate during the first 10 months of operations. Here JALLOY lasts on an average of 4 times as long as mild steel.

At both locations, approximately 45 tons of JALLOY heat-treated plate have effected a saving in the cost of steel for maintenance alone of more than $10,000. Labor savings in man-hours worked by maintenance crews have been conservatively estimated at more than $2,500.

Wherever heat-treated JALLOY plate is used to resist abrasion and impact, similar results are being obtained. Little wonder that this manganese moly steel is becoming so popular in materials-handling operations. Let us send you our booklet, "For Longer Wear . . . Less Repair." It describes how others are saving money with heat-treated JALLOY Steel Plate, The Mining and Quarrying Steel.

Jones & Laughlin Steel Corporation
465 Jones & Laughlin Building
Pittsburgh 30, Pa.

Please send me a copy of: "For Longer Wear . . . Less Repair—JALLOY—J&L Special Alloy Steel."

NAME_____

COMPANY_____

ADDRESS_____

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY *(hi-tensile steels).*

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

BAY CITY - the biggest value in ¾ yard machines . . . . easily convertible

Quick convertibility without machinery change is a feature that gives you more for your equipment dollar when you buy BAY CITY. Then too, you get ruggedness, dependability and long life that can't be matched.

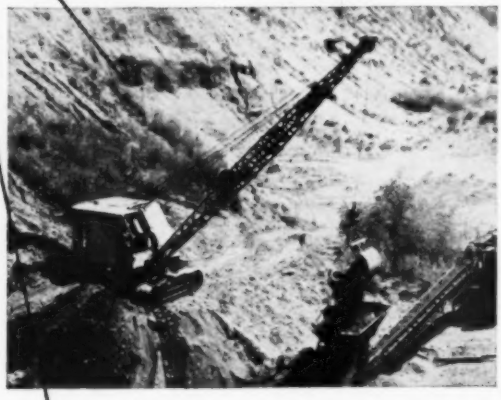
Well balanced for Crane Work.

Stability for low boom operations.

Easy operation for hard digging.

High line speeds for faster material handling.

Power for fast digging cycle.

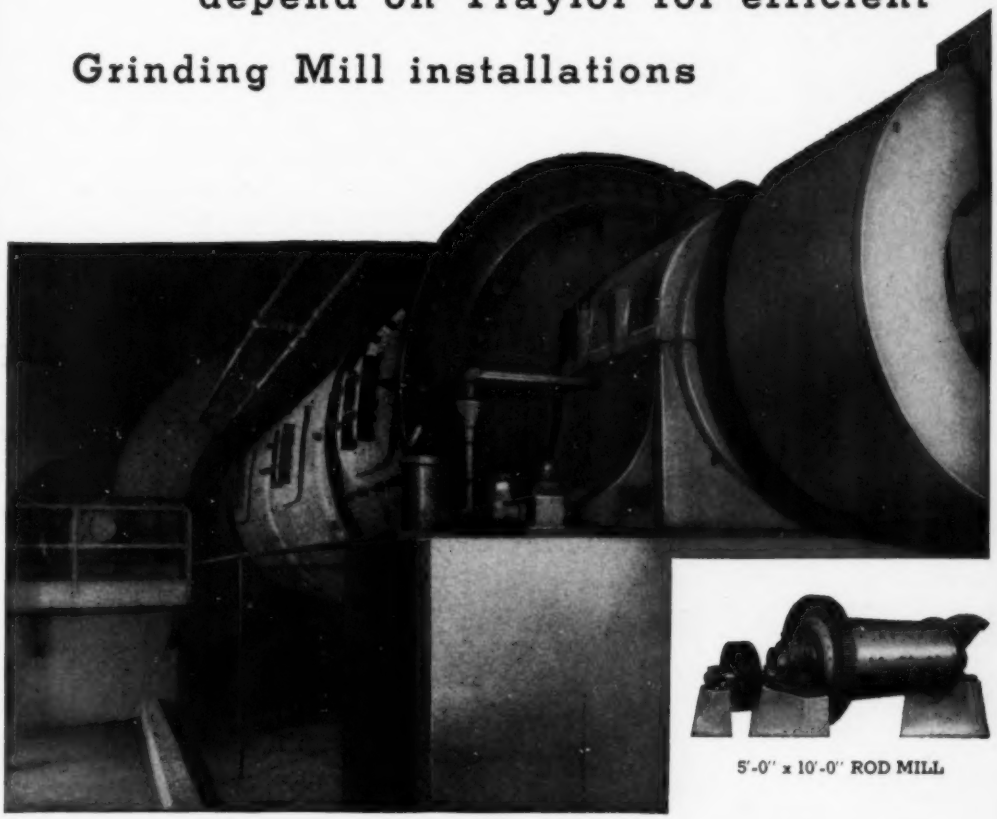


BAY CITY

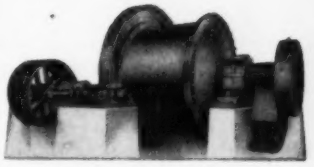
BAY CITY SHOVELS, INC., BAY CITY, MICHIGAN

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

Here's why leading chemical processors depend on Traylor for efficient Grinding Mill installations



5'-0" x 10'-0" ROD MILL



7'-0" x 5'-0" BALL MILL

More than 45 years of practical experience in making profitable grinding equipment is behind every grinding recommendation made by Traylor engineers. Through the years, Traylor has kept ahead of the industry's ever-increasing need for more efficient grinding. Built into Traylor Grinding Mills are features which permit economies in power requirements and maintenance costs and result in increased tonnage of proper fineness. These features, of which there are many, proven *in the field*, are the reasons for the acknowledged superiority of Traylor Grinding Mills. Choose the type of mill you need; Ball, Rod, Tube or Pebble, but choose a Traylor!

Traylor

Rotary Kilns, Coolers and Dryers
Grinding Mills · Crushing Rolls
Jaw, Reduction and Gyratory Crushers

TRAYLOR ENGINEERING & MANUFACTURING CO.
207 Mill St., Allentown, Pa.

Sales Offices: New York, N. Y., Chicago, Ill., Los Angeles, Calif.
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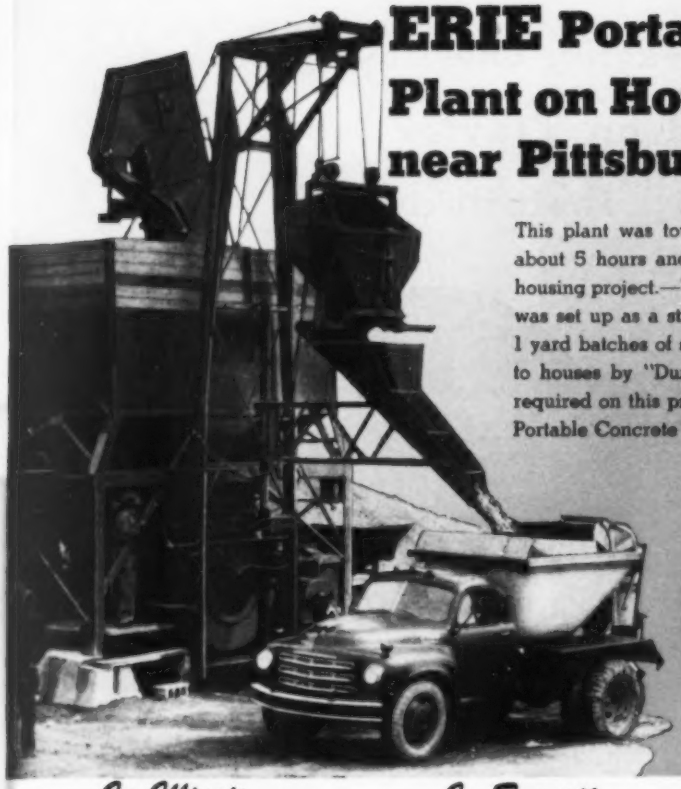
A "TRAYLOR" LEADS TO GREATER PROFITS

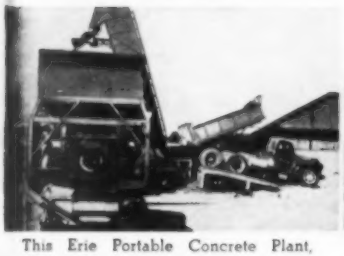
ERIE Portable Concrete Plant on Housing Project near Pittsburgh



This plant was towed from Erie to Pittsburgh in about 5 hours and set up on the site of a large housing project.—Wheels were removed and plant was set up as a stationary concrete mixing plant. 1 yard batches of specification concrete delivered to houses by "Dumpcrete" trucks. All concrete required on this project was provided by this Erie Portable Concrete Plant.

Move Your **CONCRETE PLANT** *from Job to Job and produce up to* **40 CU. YARDS PER HOUR**

In Illinois

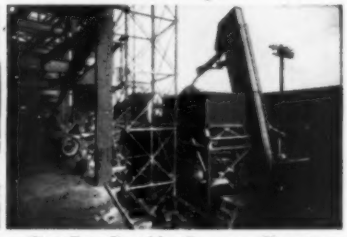


This Erie Portable Concrete Plant, electric motor driven, is set up in a town of 10,000 population to supply concrete within a 16 mile radius. Steam heating makes it possible to operate all year and sales up to 100 yards a day are recorded without taxing the full capacity of the plant.

In Transit

The above Erie Portable is being towed 100 miles to make concrete on a series of building projects. 2 men can get it into operation within 60 minutes and it can be "knocked down" for towing in less time. Booklet SP1 gives complete specifications. Write for copy.

In New York

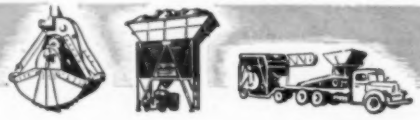


This Erie Portable Concrete Plant is completing here a 6000 cu. yard concrete job and has since been moved to three building sites in Buffalo. Consult with Erie for complete details on the Erie Portable Concrete Plant as applied to your concrete project.

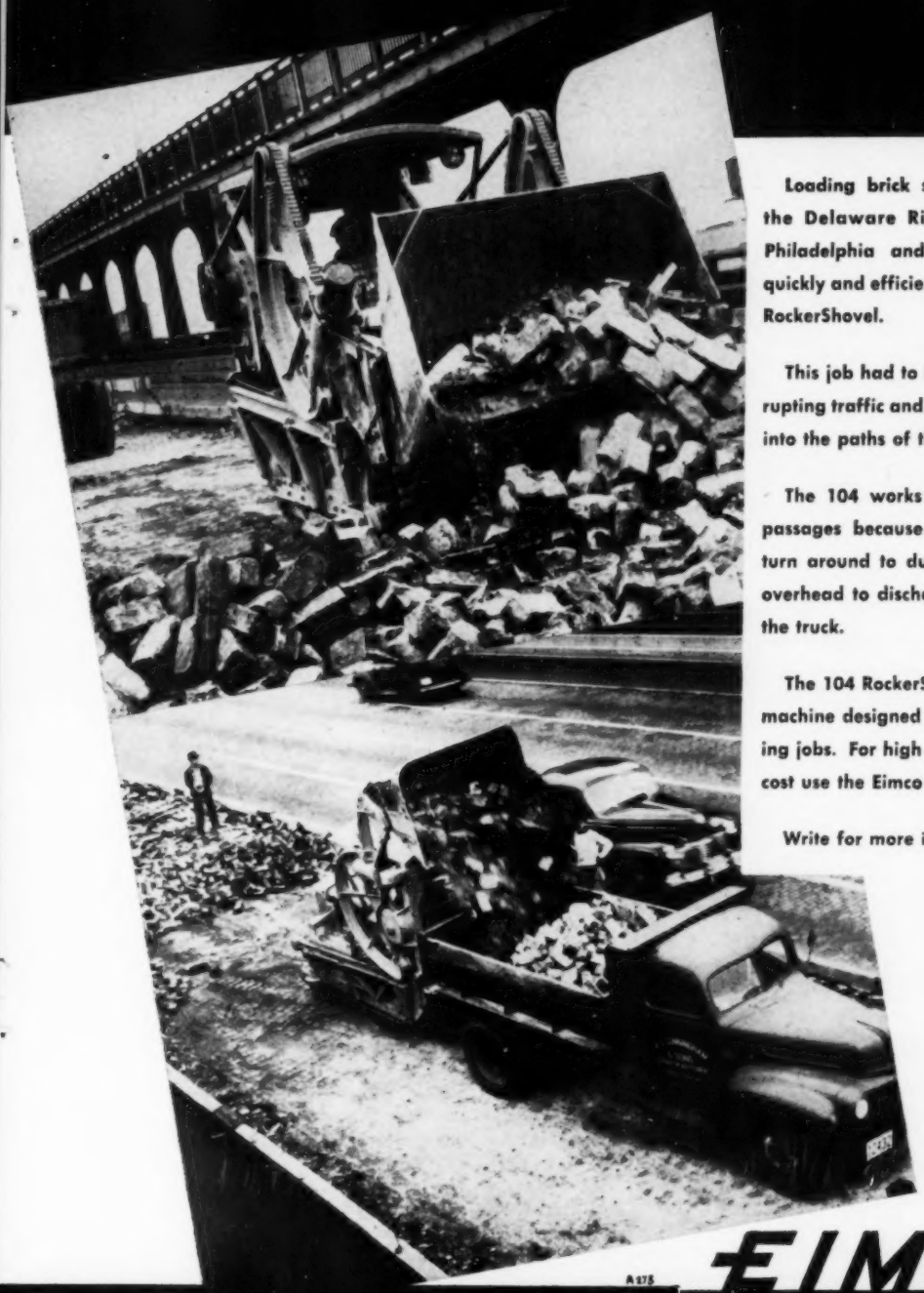
ERIE

STEEL CONSTRUCTION COMPANY

611 GEIST ROAD • ERIE, PENNSYLVANIA



HIGHWAY RESURFACING WITH EIMCOS



Loading brick surfacing material on the Delaware River Bridge between Philadelphia and Camden was done quickly and efficiently with an Eimco 104 RockerShovel.

This job had to be done without interrupting traffic and without spilling blocks into the paths of the passing vehicles.

The 104 works efficiently in narrow passages because it does not have to turn around to dump. The bucket rolls overhead to discharge the material into the truck.

The 104 RockerShovel is a heavy-duty machine designed for the toughest loading jobs. For high capacity at low initial cost use the Eimco 104.

Write for more information.

A 478

EIMCO

You can't beat an Eimco!

THE EIMCO CORPORATION

The World's Largest Manufacturers of Underground Rock Loading Machines

EXECUTIVE OFFICES AND FACTORIES — SALT LAKE CITY 9, UTAH, U. S. A.

BRANCH SALES AND SERVICE OFFICES

NEW YORK 51-52 SOUTH STREET • CHICAGO 3319 SOUTH WALLACE STREET
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EIMCO (GREAT BRITAIN) LTD., LEEDS 12, ENGLAND
AGENTS IN ALL PRINCIPAL CITIES THROUGHOUT THE WORLD

Norblo

Dust and Fume Collection... Engineered, Efficient, Economical

Shown above are three distinct types of modern dust and fume collecting equipment—Centrifugal, Hydraulic, Bag types. These three types used in combinations provide the better, more economical and more efficient solutions of a wide range of dust and fume control now demanded by modern large scale industries in the smelting, rock products, chemical, milling and processing fields.

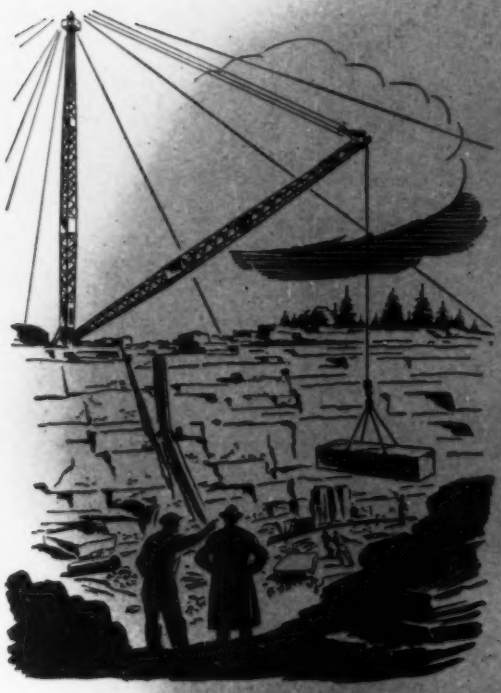
Though Norblo equipment of all three types is available in a wide range of c.f.m. capacities, Norblo is outstanding for larger, heavy duty installations.

For detailed information on each of the types shown above ask for Bulletin No. 104-2 covering centrifugal and hydraulic, or Bulletin 164-2 for automatic bag type collectors. Also available, Cement Air Cooling Bulletin No. 165-1, and complete catalog of fans No. 1002-4.

THE NORTHERN BLOWER COMPANY

6407 BARBERTON AVE. • CLEVELAND 2, OHIO

Today it's Roebling!

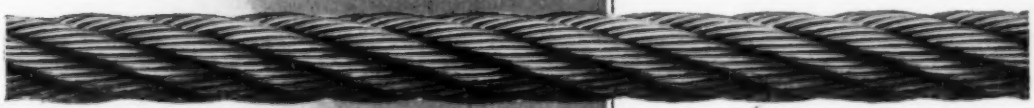


Why men who watch costs specify Roebling Preformed

THE RECORDS PROVE IT... that Roebling Preformed "Blue Center" Wire Rope stays on the job longer and cuts your costs. This is partly because "Blue Center" steel—developed and made only by Roebling—has unsurpassed resistance to abrasion, shock and fatigue. In large measure, too, it is because of the painstaking care, special techniques and modern precision machines that guard and maintain Roebling quality leadership.

Preformed a big help, too. Wide experience in the field proves that Roebling *Preforming* brings still more operating economies. Preformed is easier and faster to handle and install. You can cut it without seizing. It winds better... is not apt to set or kink... minimizes vibration and whipping.

Today's best buy. Roebling makes wire rope of every construction, grade and size ... engineered for top efficiency on every type and make of rope-rigged equipment. Have your Roebling Field Man recommend the *right* rope for best, low-cost performance on each installation. John A. Roebling's Sons Company, Trenton 2, N. J.



Both the Roebling Field Man and Roebling Engineers are always ready to help solve any special problems regarding wire rope. Their advice is firmly based on field studies, technical research and many thousands of service records.

ROEBLING

A CENTURY OF CONFIDENCE

Atlanta, 936 Avon Ave. ★ *Boston*, 51 Sleeper St. ★ *Chicago*, 5525 W. Roosevelt Road ★ *Cincinnati*, 3253 Fredonia Ave. ★ *Cleveland*, 701 St. Clair Ave., N. E. ★ *Denver*, 4001 Jackson St. ★ *Houston*, 6216 Navigation Blvd. ★ *Los Angeles*, 216 S. Alameda St. ★ *New York*, 19 Rector St. ★ *Philadelphia*, 12 S. Twelfth St. ★ *Portland*, 1032 N. W. 14th Ave. ★ *San Francisco*, 1740 Seventeenth St. ★ *Seattle*, 900 First Avenue S.

Machine illustrated has Diesel power with electric swing. Also available as full Ward-Leonard Electric machine.

MARION gave the industry a new conception of excavating equipment in 1946 when the MARION 111-M was introduced. Here was a 3½-4 cu. yd. machine with all of the benefits of Diesel power PLUS all of the advantages of electric swing. Big enough for high daily yardage, yet easily moved from one job to another. Power enough to stand up to big jobs without flinching. Heavy enough to be steady on its long, wide crawlers.

Now—the MARION 111-M is bigger and stronger—better than ever. It is a thoroughly field-proven machine, piling up performance records that are truly impressive. (Write for copies of letters from 111-M owners.)

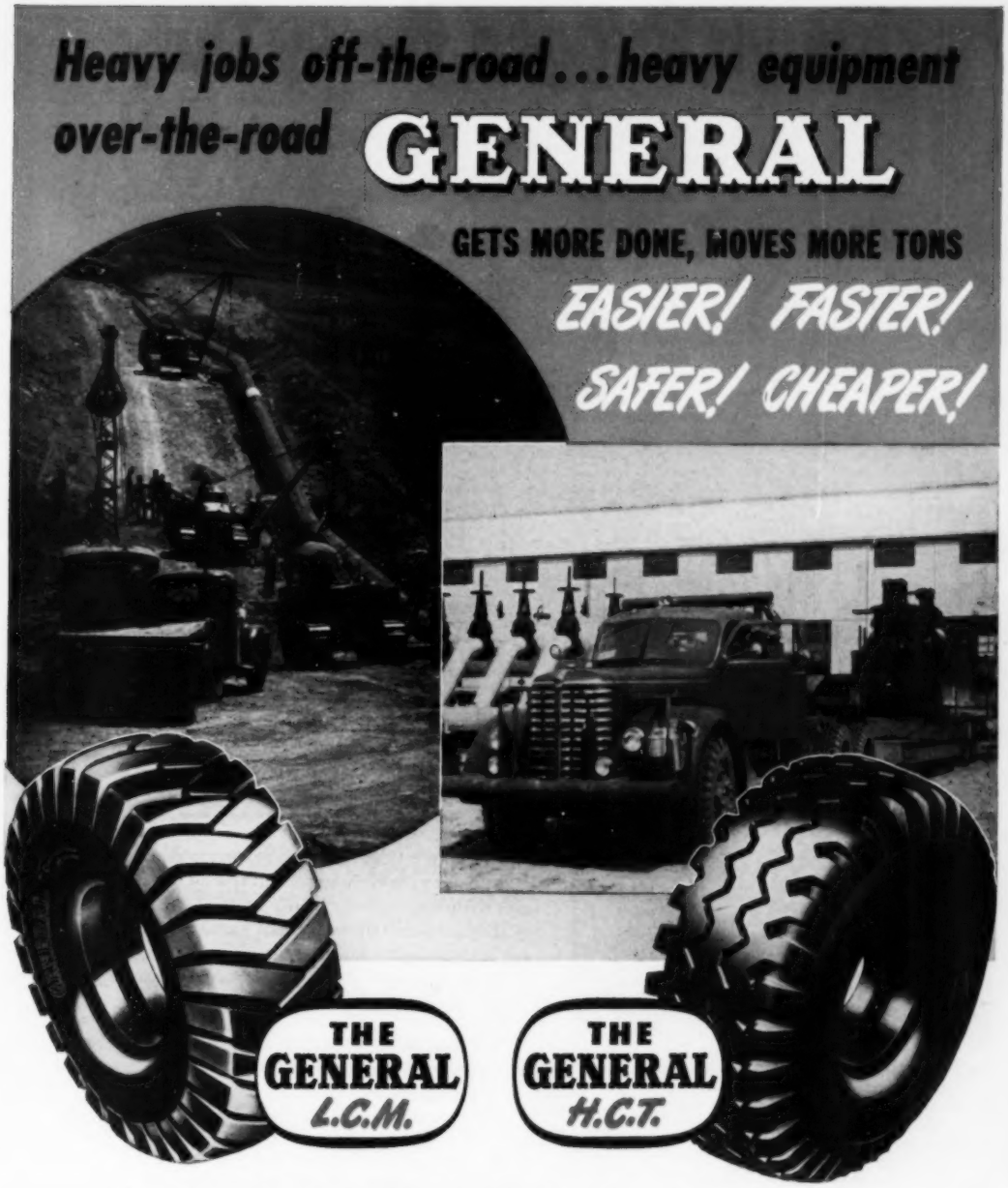
Regardless of whether you have seen the MARION 111-M before, you should see it today if a 3½-4 cu. yd. machine has a logical place in your operations. It's a rugged, heavy machine as a shovel or dragline with power and strength to spare.

The 111-M is an important new tool for heavy-duty material handling. Get the full story from your MARION representative or write to the factory for information.

MARION POWER SHOVEL COMPANY

MARION, OHIO, U.S.A.

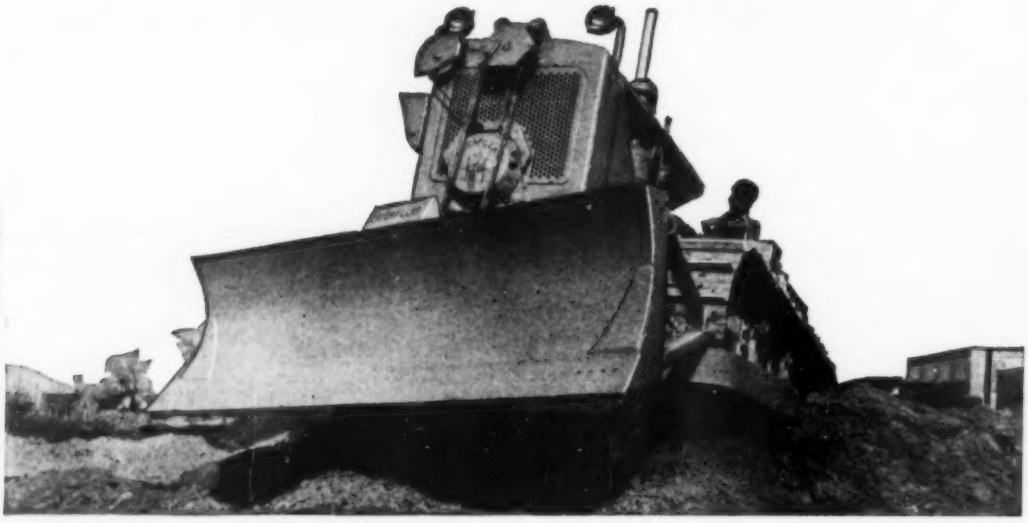
Offices and Warehouses in all Principal Cities • Established 1884

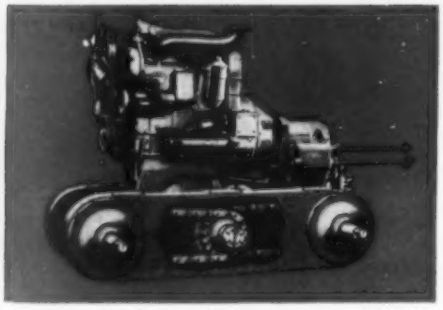


Here's General's dual-purpose team. The General H. C. T. with more, safe traction to go in and get the load . . . and take it long distances over the highway. The General L. C. M. to work 80% off-the-highway. Massive, deep lugs develop extra traction under heavy loads. Let your local General Tire Distributor show you how you can make more profit with this Top-Quality dual-purpose Truck Tire Team.

SPECIFY GENERAL TIRES ON NEW EQUIPMENT

Rough, Rugged, Heavy Duty Lubes for every equipment need!





Look over this complete line of all-weather... all-purpose lubricants!

NAME ANY LUBRICATION PROBLEM you can think of! There's the right grade and type of Cities Service lubricant to do a real job for you. This performance-tested line of quality products will help speed your heavy duty operations, cut maintenance costs, prevent equipment breakdowns. Get in touch with the nearest Cities Service office to learn how these high grade lubricants can help you.

- **Trojan All-Weather... All-Purpose Greases**
- **Pacemaker Oils**
- **Trojan Gear Oils**
- **Heavy Duty Motor Oils**

FREE — A helpful new booklet — Earth Moving and Construction Machinery lubrication. Above cutaway view is typical of illustrations found in this new 50-page book dealing with proper lubrication in the construction industry. Write today for your copy.

CITIES SERVICE OIL COMPANY
Sixty Wall Tower, Room 755
New York 5, N. Y.

Please send me without obligation your new booklet entitled "Earth Moving and Construction Machinery Lubrication."

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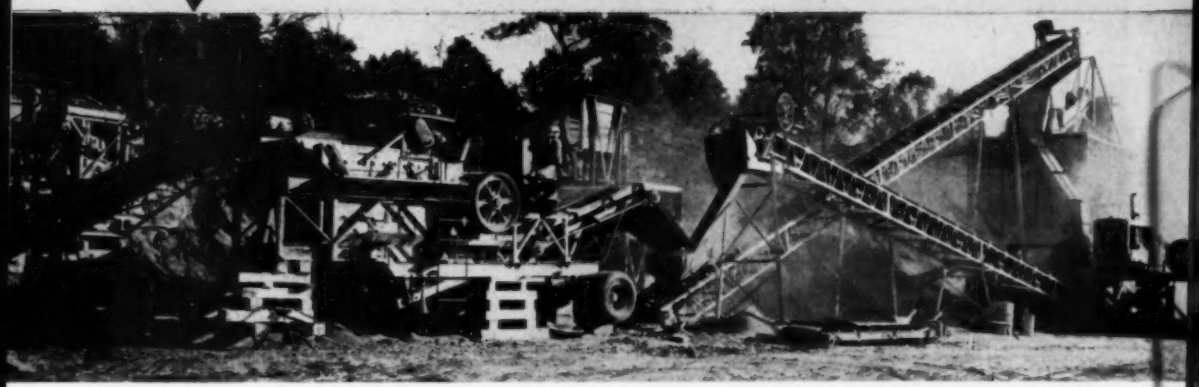
CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

"Our 'Cat' Engines seldom give us any trouble . . . for that reason we will use nothing else if we can help it."

They standardized on trouble-saving



WATERS ROCK AND GRAVEL PLANT (near Elizabethtown, Ky.) *has 6 "Cat" Engines powering crushers; a "Cat" Diesel Electric Set for lights, screens and conveyors; 2 "Cat" Engines driving compressors; a "Cat" Engine in a shovel; a "Caterpillar" track-type Tractor.*

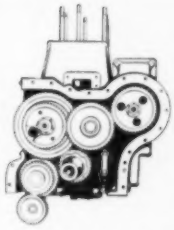
THE above statement came from H. L. Waters, partner in the Waters Construction Company (Elizabethtown, Ky.) which owns 11 "Caterpillar" Diesels. "These engines," he added, "operate in a cloud of dust all the time. But they stand up!"

Yes, there's little work for a power "trouble shooter" where "Cat" Diesels drive the whole works . . . for there's little need for tinkering, no need for studying assorted makes or types of units, and no need for scrambling all over the map when you need replacement parts or other dealer service.

Standardizing on "Caterpillar" equipment (earthmoving as well as engines) doubles up on two very desirable money-making and money-saving factors: You get equipment tens of thousands of owners regard as the toughest, most dependable and longest lasting of its kind. And you get the support of a factory-and-dealer service organization that is without equal for facilities, completeness and convenience. See your "Caterpillar" dealer for the whole story.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

LOOK UNDER THE HIDE



Pressure-lubricated "Caterpillar" timing gears are of wide-faced, helical design. Select steels and heat treatment methods are carefully matched to the type of service expected. Timing gears are upset forged . . . turned, shaped and shaved to average within 50-millionths of an inch of true surface smoothness. Look under the hide for "Caterpillar" quality. You'll find it in every detail.

CATERPILLAR

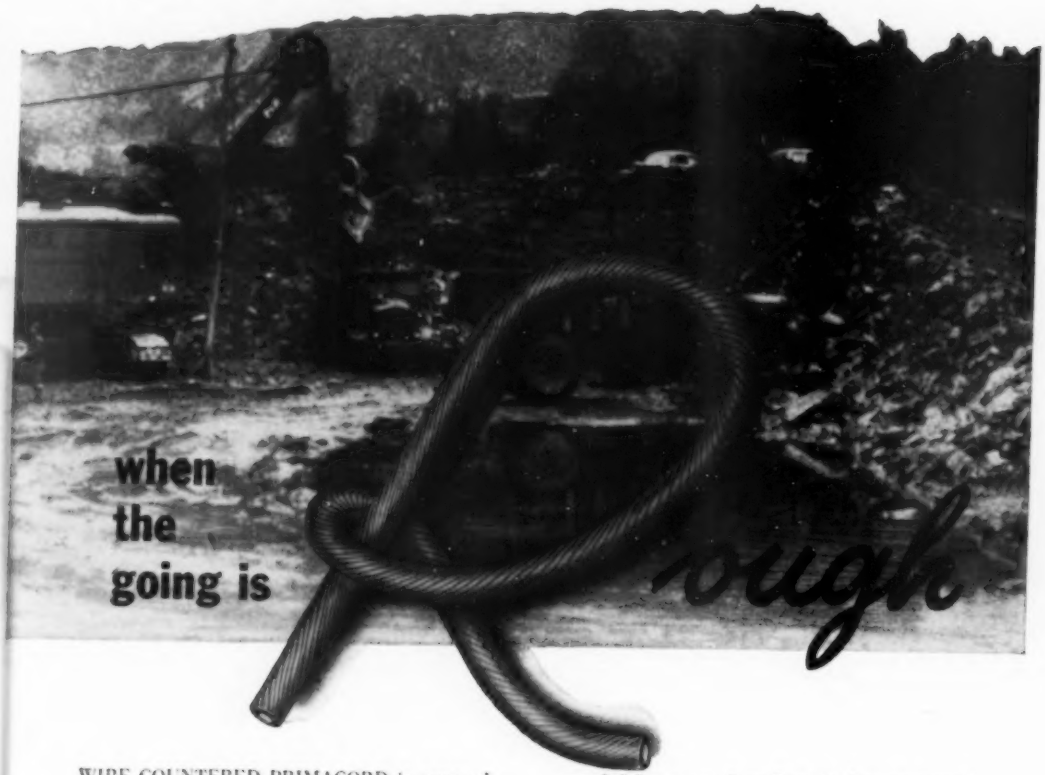
REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS

MOTOR GRADERS • EARTHMOVING EQUIPMENT

WIRE COUNTERED PRIMACORD

makes it easy . . .



WIRE COUNTERED PRIMACORD is *armored* with closely stranded brass wire. This wire countering has 2 important advantages:

1. The wires increase the *tensile* strength of the Primacord.
2. The wires *resist abrasion:* protect the Primacord during loading operations, or when it is used in ragged holes.

For these reasons, Wire Countered Primacord is favored when the going gets rough. It is recommended for use as down lines in deep or ragged holes. Hook up to the main line with a simple half-hitch — it is not necessary to strip the wires to secure positive detonation.

There is a grade of Primacord to meet every blasting condition: Plain, Reinforced, Wire Countered and Plastic Covered. Each is flexible, easily handled from spools containing 500 and 1,000 feet each; waterproof, and insensitive to stray electrical currents.

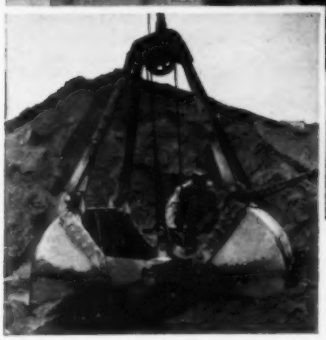
Ask your explosive supplier, or write to The Ensign-Bickford Company, Simsbury, Conn.

Wire Countered

PRIMACORD-BICKFORD Detonating .Fuse.

SOUTHERN MATERIALS COMPANY ALMOST DOUBLES WIRE ROPE SERVICE LIFE WITH J&L CENTERFIT

J&L STEEL



ABOVE: This Dravo C-14 whirler crane with a clamshell bucket moves hundreds of tons of sand and gravel daily. Holding and closing lines are J & L CenterFit wire rope.

LEFT: CenterFit closing line on this multiple reeved clamshell lasted an average of more than five weeks longer than competing ropes in this application.

J&L CenterFit Holding and Closing Lines Outlast Nearest Competitor by an Average of More Than 5 Weeks

Here's a report on the service life of J & L CenterFit Wire Rope from the Southern Materials Company, Richmond, Va., large producers and handlers of Sand, Gravel, Ready Mixed Concrete, SOLITE and Slag.

Southern Materials used a Dravo C-14 whirler crane with a 2 cu. yard clamshell bucket to test four competing brands of wire rope, among them J & L CenterFit wire rope.

Among the ten ropes tested J & L CenterFit holding and closing lines had an average service life of nearly twice that of the competing brands.

This is how the ten ropes compared:

Brand	Service Life
A	5 weeks 3 days 5 weeks 1 day 5 weeks 1 day
B	5 weeks 3 days 3 weeks 6 days
C	7 weeks 4 weeks 6 days
J&L CENTERFIT	10 WEEKS 2 DAYS 14 WEEKS 10 WEEKS

It's no wonder that equipment owners are turning to CenterFit—the new wire rope produced exclusively by J&L for use on equipment having small sheaves and drums.

Unlike conventional wire ropes CenterFit is laid together in one operation. All strands run in the same direction with outside strands fitting snugly into the valleys between inside strands. This unique construction means more steel and fewer voids than any conventional wire rope. The result: Higher Strength . . . Greater Flexibility . . . Easier Handling . . . Longer Service Life.

Get the facts on this new wire rope design. Write Jones & Laughlin Steel Corporation, 465 Jones and Laughlin Bldg., Pittsburgh 30, Pa., for our free booklet, "CenterFit".

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY *(hi-tensile steels).*

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

NI-HARD widely used ...where abrasion is severe

ONE OF THE HARDEST commercial products of the iron foundry is a *nickel-chromium white cast iron* trade-named "NI-HARD*".

HARDNESS RANGE

Its Brinell hardness ranges from 550 to 650 when sand cast, and 600 to 725 when chill cast.

This extreme hardness . . . at the moderate price of NI-HARD . . . provides abrasion resistance at lowest ultimate cost.

STRUCTURE

Unlike other cast irons . . . NI-HARD comprises a multitude of hard carbides firmly embedded in a matrix which is as hard as fully hardened steel. NI-HARD is unmachinable except in special cases. Finishing requirements are met by grinding or the use of cast-in-place machinable inserts.

PERFORMANCE

NI-HARD develops abrasion resistance two to three times better than that of unalloyed white iron. Therefore NI-HARD can economically replace white iron.

NI-HARD lasts one and one-half to two times as long as austenitic manganese or carbon steels, under conditions involving only moderate impact. Chill cast parts are stronger and more abrasion-resistant than comparable sand castings.

STRESS RELIEF

The strength and toughness of NI-HARD castings are increased fifty to eighty per cent, without loss in hardness or abrasion resistance, by a stress relieving treatment at 400-450°F. User experience has demonstrated the merit of specifying this treatment.

APPLICATIONS

Applications include: grinding balls, ball and rod mill liners, slurry pump parts, flotation impellers, piping, scoop lips, classifier shoes, roll heads, pulverizer rings, chutes and hopper liners, muller tires, plows, pug mill knives, clay augers. Also coke grizzly discs, crusher rolls, coal mine pumps, dredge pump impellers, liners, rings and sleeves. Also industrial food grinding burrs and attrition mill plates.

AVAILABILITY

NI-HARD is widely used wherever severe abrasion is encountered. Its remarkable properties minimize replacements and repairs.

Authorized foundries throughout the country readily produce NI-HARD castings in all forms and shapes common to the iron and steel foundry.

INFORMATION AVAILABLE

Full information is yours for the asking. Write for the booklets, "Engineering Properties and Applications of NI-HARD", and, "Buyers Guide for NI-HARD Castings."

*Reg. U. S. Pat. Off.

EMBLEM OF INCO SERVICE
TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

Put safety and reliability into your boom supports

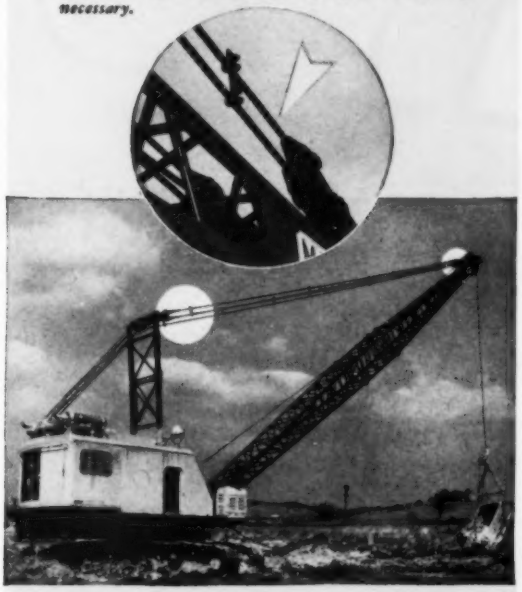
with new Fatigue-Resistant

TIGER BRAND WIRE ROPE ASSEMBLIES

▸ *An exclusive development of* ***American Steel and Wire Company***

HERE'S THE TROUBLE SPOT

On old style boom supports, vibration was concentrated at the point where the wire rope entered the socket. For machines where vibration was *not* severe, this assembly was satisfactory. But for today's high-power, high-speed machines, *a boom support with much greater resistance to fatigue is absolutely necessary.*



HOW THE TROUBLE WAS ELIMINATED

The New Fatigue-Resistant Tiger Brand Wire Rope Assemblies are an *innovation.* They effectively combat the most severe vibration on power shovels, draglines and cranes. Note carefully the novel end thimble interwoven into the pendant. Vibration is dampened over a long section instead of being concentrated at one point.

2 TO 3 TIMES LONGER LIFE

The new construction has been proved in actual operation to last two to three times longer than the old assemblies — and in some cases even better results were obtained.

INTERCHANGEABLE ON STANDARD EQUIPMENT

You can replace your old boom supports with these new assemblies quickly and easily because essential dimensions such as pin diameters, distance between ears, etc. are the same as for standard open and closed sockets. Send the coupon for complete information.

American Steel & Wire Company
Rockefeller Building, Dept. H-110
Cleveland 13, Ohio

Please send me complete information on your new Tiger Brand Boom Support Assemblies.

Name.....

Title.....

Company.....

Address.....

City..... State.....

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

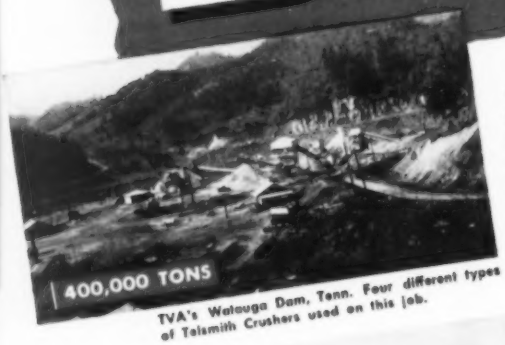
USS AMERICAN TIGER BRAND WIRE ROPE

AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

TELSMITH® EQUIPMENT FOR DAMS



TVA's Watauga Dam, Tenn. Four different types of Telsmith Crushers used on this job.

● Huge dam projects and Telsmith Aggregate Plants go together. Many dam builders call in Telsmith engineers right at the start—for consultation as to the proper plant layout and the right equipment to use. Then Telsmith makes the detailed drawings for the erection of the plant and furnishes most of the machinery. Telsmith designed plants have proven their efficiency on many large projects and Telsmith equipment has a world-wide reputation for the production of low-cost aggregate. The ruggedness of Telsmith equipment is strikingly demonstrated by long life in severest service, on successive projects. After producing 1,500,000 tons of aggregate at Center Hill Dam, the same Telsmith equipment is now turning out about the same amount of aggregate at Buggs Island Dam.

Center Hill Dam, Tenn. Telsmith designed complete crushing-screening plant; and furnished most of the equipment.

Buggs Island Dam, Va. This Telsmith crushing plant also produced the aggregate for Center Hill Dam.

Save TIME and MONEY

Consult Telsmith Engineers—Ask for Bulletins 266 and 271

Norfork Dam, Ark. This 500 ton per hr. capacity combination quarry and sand and gravel plant was Telsmith designed and equipped.

MILWAUKEE TELSMITH WIS. U.S.A.

Philpott Dam, Va. Here, too, the crushing-screening equipment is Telsmith.

Mount Morris, Dam, N. Y. The 300-350 tons per hour rock crushing plant is Telsmith designed and equipped.

OTHER DAMS BUILT WITH TELSMITH EQUIPMENT

- Alatoona Dam, Georgia
- Ariel Dam, Ariel, Wash.
- Boysen Dam, Shoshoni, Wyo.
- Carpenter Dam, Arkansas
- Cascade Dam, Washington
- Clark Hill Dam, Augusta, Ga.
- Conowingo Dam, Conowingo, Md.
- Dale Hollow Dam, Tennessee
- Davis Dam, Nevada
- El Presidente Dam, Mexico
- Fort Gibson Dam, Oklahoma
- Grand Coulee Dam, Washington
- Kortes Dam, Wyoming
- Morony Dam, Montana
- South Holston Dam, Tennessee

MS-11

SMITH ENGINEERING WORKS

504 EAST CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

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51 East 42nd St. New York 17, N. Y. — 211 W. Wacker Drive Chicago 6, Ill. — 713 Commercial Trust Bldg. Philadelphia 2, Pa. — 238 Main Street Cambridge 42, Mass. — Boehck Eqpt. Co. Milwaukee 3, Wis. — A. N. Wigle, 362 S. Ashburton Rd. Columbus 13, Ohio

Clyde Eqpt. Co., Portland 9, Ore., & Seattle 4, Wash. • Mines Eng. & Eqpt. Co., San Francisco 4, Calif. • Interstate Equipment Co., Statesville, N. C.

Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Wilson-Weesner-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.

BIG T7 TRAXCAVATOR Keeps BIG quarry profitable

— for LATROBE CONSTRUCTION CO., LATROBE, PENNSYLVANIA

Ability to excavate hard clay landed this T7 TRAXCAVATOR the job of moving 100,000 cubic yards of dirt from a mile-long, 30-foot highwall. Then the big-capacity machine dug out a 2-foot-thick dirt-layer, 400 feet wide and a mile long, at the base of the wall.

Owned by Latrobe Construction Co., Latrobe, Pennsylvania, this outfit also cleans-up the quarry after blasts, loading shot-rock on trucks, and in its spare time loads stockpiled stone.

"If I didn't have this TRAXCAVATOR unit I couldn't keep this quarry working profitably," declares Quarry Superintendent.

Stamina to load, lift, carry and dump solid, heavy quarry materials on a continuous production basis is built into every TRAXCAVATOR size. Frame structure and power unit, lifting arms and bucket, too, are built to absorb and resist the slam-bang shock, stress and abrasion of rock-quarrying.

Equip your quarry with the TRAXCAVATOR you need, making your selection from the only line with a full range of job-fitting sizes, (5 Models, 1/2 to 4 cubic yards capacity). See your TRACKSON-"Caterpillar" Dealer soon, or write direct to TRACKSON COMPANY, Dept. PQ-110, Milwaukee 1, Wisconsin, for full information; no obligation.

THE ORIGINAL TRACTOR EXCAVATOR . . . One of the regular jobs for this T7 TRAXCAVATOR is cleaning up after blasts, at the quarry of Latrobe Construction Co., Latrobe, Pennsylvania.

TRAXCAVATOR® ***The Original Tractor Excavator***

STRENGTH in dependable paper shipping sacks starts with KRAFT

. . . and the strongest, toughest kraft comes from our own mills, made under the watchful supervision of our own master Kraftsmen.

Then, in the most modern plant of its kind, this strong, tough kraft is fashioned into heavy-duty, multi-wall shipping sacks.

We make them in many sizes and many plies, printed or plain, either open mouth or valve, sewn or pasted, flat sewn open mouth or flat sewn valve.

In fact, we make sacks to fit your own particular specifications—or we'll design them to fit special needs.

Now, more products are economically sent to market in the strongest KRAFT all-purpose multi-wall bags yet produced.

You'll find that out when you investigate.

KRAFT BAG CORP.
GILMAN PAPER COMPANY SUBSIDIARY

Send your product to market in a "KRAFT BAG"—*the container for a thousand uses!*

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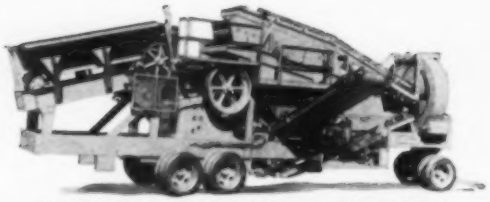
Western Sales Office:
Daily News Building, Chicago 6, Ill.

Plants at St. Marys, Georgia and Gilman, Vermont



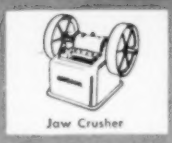
TwinDual 293Q Pacemaker Portable Rock and Gravel Plant

Stationary Crushing, Screening and Washing Plant

PLAN FOR '51 WITH UNIVERSAL FOR PEAK PROFIT PRODUCTION

Whether you want a complete portable or stationary plant for crushing and screening rock, gravel, aglime or washed aggregates—or individual "basic units" to step up your present operations check with Universal. North, east, south and west, experienced operators choose Universal for smooth operation, top capacity and lower costs per ton.

In planning a new or modernized plant, discuss your needs early with your Universal distributor. Now is the time to obtain information for next year's operation. Check coupon and mail today.

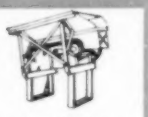


Jaw Crusher

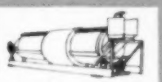
Roll Crusher

Hammermill

Conveyor



Apron Feeder



Revolving Screen—Scrubber

Gyrating Screen

Bucket Elevator

Conveyor Hardware

Steel Bin

Sand Screw—Log Washer

JUST CHECK AND MAIL

Universal Engineering Corporation, Cedar Rapids, Iowa—I am interested in the equipment checked. Please send complete details.

	Portable	Stationary		Portable	Stationary
ROCK PLANTS	☐	☐	LIME PLANTS	☐	☐
GRAVEL PLANTS	☐	☐	WASHING PLANTS	☐	☐

BASIC UNIVERSAL UNITS

JAW CRUSHERS ☐	CONVEYORS		Revolving Screens ☐
	Stationary ☐		Revolving Scrubbers ☐
ROLL CRUSHERS	Portable ☐		Bucket Elevators ☐
TwinDual Rolls ☐			Gyrating Screens ☐
Standard Rolls ☐	FEEDERS		Conveyor Hardware ☐
	Plate ☐		Bins ☐
HAMMERMILLS ☐	Apron ☐		Sand Screws ☐
	Portable ☐		Log Washers ☐

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ADDRESS _____

CITY _____

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UNIVERSAL ENGINEERING CORP. division of PETTIBONE MULLIKEN CORP.

619 C Avenue N. W., Cedar Rapids, Iowa
Phone 7105

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HAISS
NEW YORK, N. Y.

UNIVERSAL
CEDAR RAPIDS, IOWA.

User Reports . . .

N-B-M #397 SILVER BABBITT LASTS 5 TIMES AS LONG!

Large Portland Cement Plant used N-B-M Silver Babbitt on Crusher Bearings. Result? 400% *longer bearing life* . . . 30% *lower babbitt cost!*

The superintendent of this cement plant was —in his own words—"naturally skeptical" when quoted the low original cost of N-B-M #397 Silver Babbitt, compared to a tin-base babbitt then being used. But, later he writes:

"We are happy to say the #397 Silver Babbitt has already given us 4 to 5 times the service of the other metal. We believe the record speaks for itself."

These big savings—*in both original cost and actual service cost*—are possible because #397 Silver Babbitt costs 30% to 40% less than tin-base babbitt—yet has these important features that insure easy handling and better bearing performance:

- **Retains hardness at higher temperatures**
- **Easy to bond**
- **Has high resistance to corrosion**
- **Embeds grit—even at room temperature**

N-B-M Silver Babbitt offers plant and product engineers this real challenge: *chances are that it can make important savings in your plants or products.* Investigate it now—write today for complete information and prices!

This folder gives complete facts . . . Lists physical properties and operating characteristics of N-B-M Silver Babbitt. Engineering Brief gives instructions on preparation of shells for good bonding, and pouring. Be sure to ask for your free copy!

Please send me your free folder on N-B-M Silver Babbitt . . .

Name.....

Title.....

Company.....

Address.....

City.....State.....

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

4941 Manchester Avenue • St. Louis 10, Mo.

PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

Which One is You ?

type one

Do you drill holes all over the lot? A few in this cut—a few for that footing? Then you'll choose the lightweight LCM—the ideal wagon drill for use where moves are frequent.

type two

Do your jobs call for fast drilling? Big footage on every shift? Then you'll want the universal URM—for the last word in wagon drill efficiency and performance.

type three

Do you run into a lot of heavy rock excavation—with cuts up to 40 feet deep? Then the Gardner-Denver WD is the wagon drill for you. It's specially designed for deeper holes.

LCM FEATURES:

Lightweight — easy to move
Positive feeding pressure
Convenient feed and drill controls
Highly maneuverable
Equipped for 6-foot steel changes

URM FEATURES:

Simple, responsive controls
Maintains correct bit pressure
Positive, effortless blowing
Adjustable wheels and mast
Handles 6-foot steel changes

WD FEATURES:

Extra powerful blowing
Air motor feed
Power operated mast
Speeds line drilling and broaching
For 10 or 15-foot steel changes

Whether your drilling pattern fits Type 1, 2 or 3—choose a Gardner-Denver Wagon Drill for faster, easier drilling. Write for Bulletin WD-1.

GARDNER-DENVER *Since 1859*

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada) Ltd., Toronto, Ontario

EATON

2-Speed Truck

AXLES

for the life of your trucks

They increase truck life . . . they last the life of the truck—that's what operators say about Eaton 2-Speed Axles.

They give extra vehicle miles because the driver has twice the conventional number of gear ratios at his command. He selects the ratio best suited to operating conditions, with less strain on engine and power transmitting parts. The engine runs at peak efficiency, saving gasoline and oil.

Eaton Axles match the truck for durability. The exclusive planetary system permits rugged construction and minimizes load on any one gear or bearing. Wear is reduced by another exclusive feature—forced-flow, positive lubrication.

Get full information about Eaton 2-Speed Axles (on most 1½ ton and larger trucks) from your truck dealer.

Axle Division

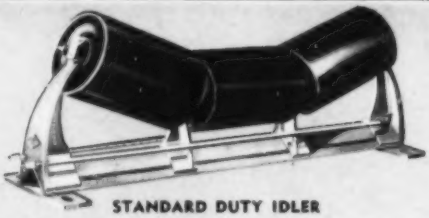
EATON MANUFACTURING COMPANY

CLEVELAND, OHIO

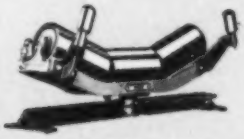
EATON

PRODUCTS: SODIUM COOLED, POPPET, AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • JET ENGINE PARTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS SPRINGTITES • SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS

THERE'S A *Continental* IDLER for every purpose



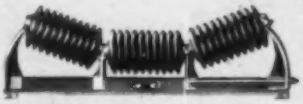
STANDARD DUTY IDLER



SELF-ALIGNING TROUGHING IDLER

SELF-ALIGNING RETURN IDLER

FLAT ROLL



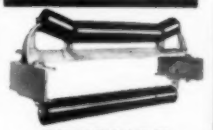
RUBBER DISC IMPACT IDLER

SELF-ALIGNING FLAT BELT IDLER

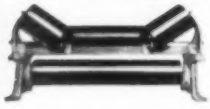
FLAT BELT IDLER

HEAVY DUTY IDLER

GRAIN FLAT BELT IDLER



PICKING TABLE IDLER



GRAIN CONCENTRATOR IDLER

UNIT STAND IDLER

Belt conveyors are used for handling many types of material. For this reason, Continental manufactures a variety of Idlers, each designed to best take care of a particular application.

When ordering your next Belt Conveyor, specify Continental Idlers and take advantage of our complete line.

Most standard size Idlers can be shipped FROM STOCK. Other sizes can be shipped promptly.

Specify CONTINENTAL

CO 4804

INDUSTRIAL DIVISION

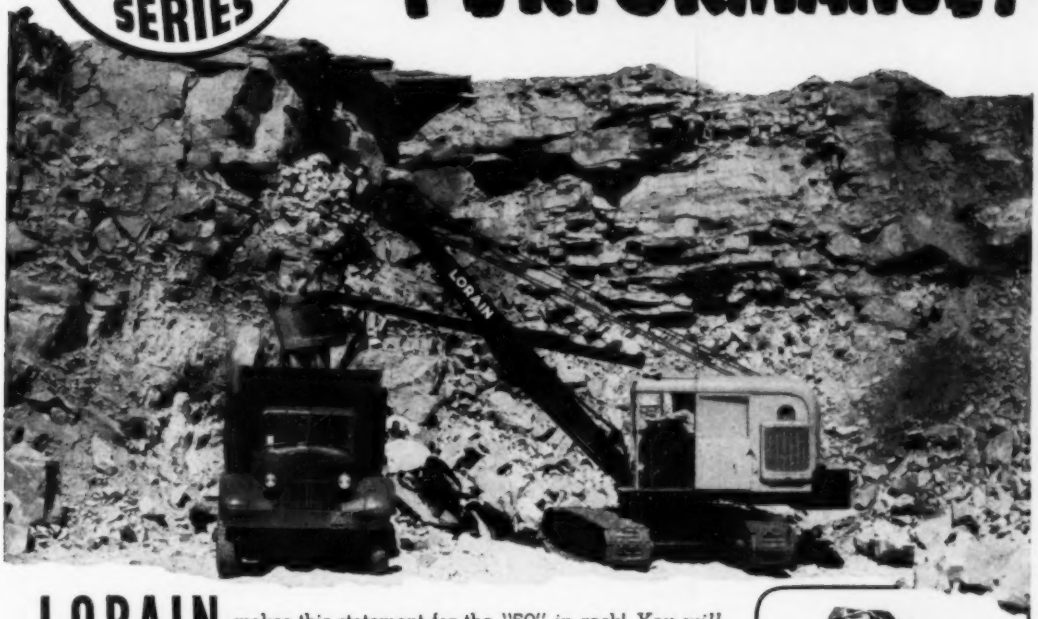
CONTINENTAL GIN COMPANY

BIRMINGHAM, ALABAMA

ENGINEERS CGC ATLANTA • DALLAS • MEMPHIS • NEW YORK CGC MANUFACTURERS

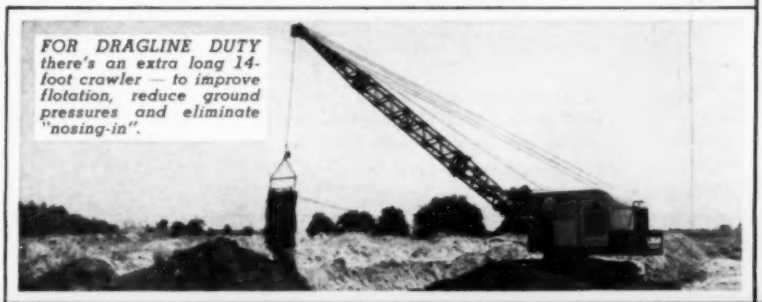
LORAIN 50 SERIES

ROCK BUSTING
(NOT SHOVEL BUSTING)
PERFORMANCE!

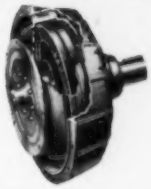


LORAIN makes this statement for the "50" in rock! *You will dig more rock with less shock and work more hours per year!* The reason? There's a shock-absorbing hydraulic coupling on the engine drive. Scientific tests prove that the shocks and strains of rock digging are gently cushioned by this "fluid drive". Not only are these digging shocks stopped short of the engine but they "melt" away without ever reaching the turntable mechanism and cables. You can put power at its peak into "rock-busting" performance — with the assurance your Lorain-50 shovel takes no undue punishment that will lead to "shovel-busting" headaches. Your Distributor for Lorains will back up these facts — ask him for the proof about the "50".

THE THEW SHOVEL COMPANY, LORAIN, OHIO



FOR DRAGLINE DUTY there's an extra long 14-foot crawler — to improve flotation, reduce ground pressures and eliminate "nosing-in".



HYDRAULIC COUPLING

Kills Shock in Rock

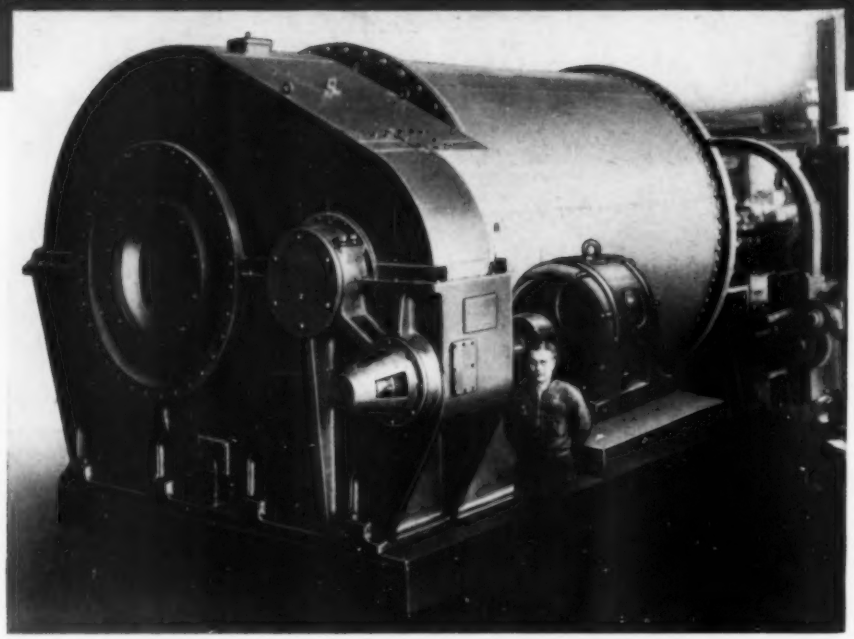
Only the Lorain-50 "Series" Shovel offers you these important advantages in a 1-yard class machine! They add yards and years to performance in rock . . .

- **The engine can't be stalled under any digging condition.**
- **Digging impacts and stresses are absorbed by the fluid clutch — can't reach either *engine* or *turntable*.**
- **Power "hangs-on" until the dipper is loaded with the toughest rock.**

You Get Them Only In The "50"

SEE YOUR THEW-LORAIN DISTRIBUTOR FOR PROFIT FACTS ON THE "FIFTY"

IT COSTS *LESS* TO OWN THE BEST!



FEATURES

Hourly capacity:
21 tons — 112 barrels

•

Fineness:
With 200-mesh, 98.7% minus
With 325-mesh, 94.1% minus

•

Specific surface, 2100

•

800 HP synchronous motor uses only 750 HP

•

Exhausters equipped with 200 HP motors using only 145 HP

•

Above capacities obtained with clinker ranging in size up to 2"

Specifications of all types of KVS Mills available on request.

KENNEDY 10' x 18' AIR SWEPT TUBE MILL FOR CLINKER GRINDING

Marked economy of operation distinguishes the new Kennedy 10' x 18' Air Swept Tube Mill. Its large capacity, speed and low power consumption shown in the adjoining box invite comparison.

Designed for either raw or finish grinding, this mill reduces clinker to a fineness of 98.7% minus through 200-mesh with minimum power consumption . . . it's a TOP rating.

Exclusive KVS built-in features include integral gear drive connected directly to drive shaft; shaft carried in roller bearings cannot be misaligned; all gears and bearings automaticlly oil sprayed.

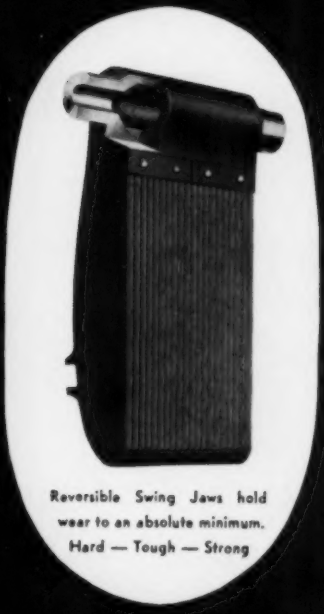
In design and construction this is the most modern tube mill on the market. In use all over the world, it is proving its worth under every operating condition. Users say, "It Costs Less To Own The Best" when you specify KVS.

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

TWO PARK AVENUE, NEW YORK 16, N. Y. FACTORY: DANVILLE, PA.

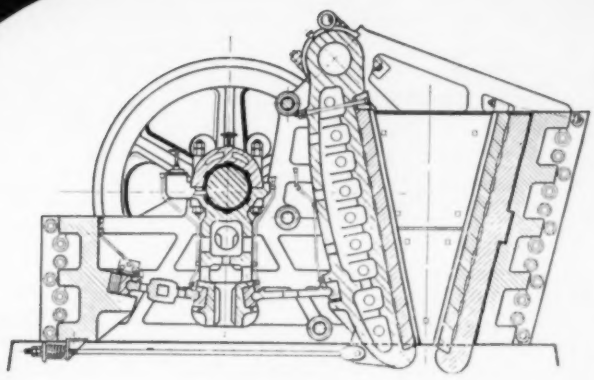
IT COSTS LESS TO OWN THE BEST

KENNEDY SWING JAW CRUSHERS



Reversible Swing Jaws hold wear to an absolute minimum. Hard — Tough — Strong

POWER-PACKED, RUGGED BUILT TO CRUSH AND TO LAST!



Scale drawing of Kennedy Swing Jaw Crusher.

Built with crusher openings from 7 inches to 66 inches . . . 6,000 to 600,000 lbs.

Frames of Herculite steel with tensile strength up to 60,000 lbs. per square inch.

BUILT TO YOUR SPECIFICATIONS IN ANY SIZE REQUIRED

Send for bulletin describing KVS crushers

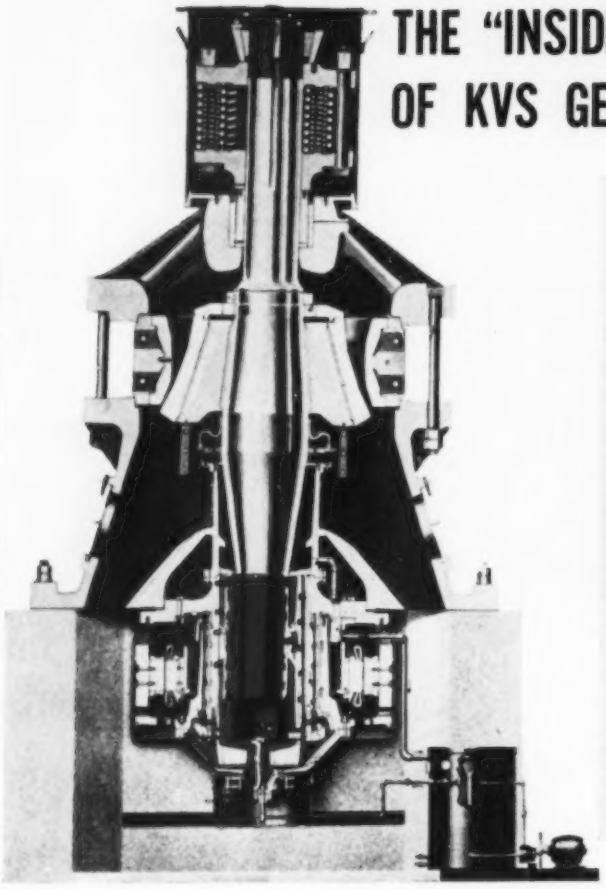
KENNEDY-VAN SAUN MFG. & ENG. CORP'N

TWO PARK AVENUE, NEW YORK 16, N. Y.

FACTORY: DANVILLE, PA.

IT COSTS LESS TO OWN THE BEST!

THE "INSIDE STORY" OF KVS GEARLESS CRUSHERS



CUTAWAY DRAWING OF ROLLER BEARING TYPE "S" CRUSHER

The oiling system is the heart of every crusher. When it fails, bearings burn out . . . weeks of valuable time are lost in making replacements . . . work stops . . . and so does income! KVS offers the solution to this ever-present problem with their positive oiling system. Built without "gimmicks" and trick safety devices that ail too often fail to work, this system is virtually fool-proof.

A simple gear pump draws oil from a serpentine cooled tank and, under pressure, pumps it through a filter to a compartment below the ball socket bearing. Oil is then forced UP between this bearing and the shaft and overflows to the eccentric and pulley bearings. This floods the roller bearings, and the oil then overflows into the storage tank. A bypass releases the pressure back into the storage tank, thus maintaining a constant and even flow at all times.

It has been proved through countless tests and is, today, the "Heart" of the famous Kennedy Gyratory Crushers. It provides a system that oils vital parts without failure and without depending on someone's memory.

IT'S CORRECTLY DESIGNED TO LAST FOR YEARS

The oiling system in the Kennedy Gearless Crusher is perfect. Approximately 4 barrels of oil per hour are constantly pumped through the bearings and there is no waste—no spillage of oil. It is the most perfect oiling system that was ever put on a crusher. These crushers have been known to run for many years without renewals to the eccentric.

Send for engineering bulletin describing this system

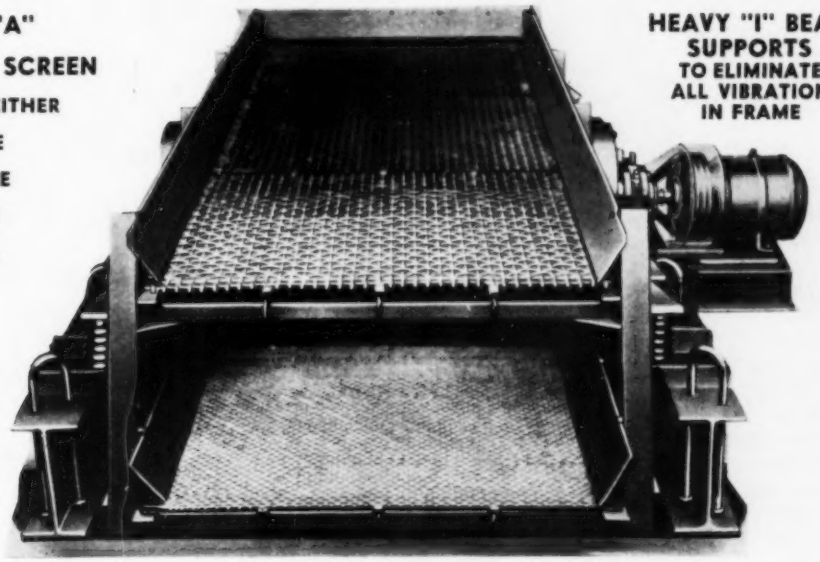
KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

TWO PARK AVENUE, NEW YORK 16, N. Y. FACTORY: DANVILLE, PA.

IT COSTS *LESS* TO OWN THE BEST!

THE VIBRATING SCREEN WITH THE "FOUR-WAY" MOTION

TYPE "A" VIBRATING SCREEN
BUILT IN EITHER
SINGLE
DOUBLE
TRIPLE
DECKS



HEAVY "I" BEAM SUPPORTS TO ELIMINATE ALL VIBRATION IN FRAME

ECCENTRIC FLY-WHEEL GIVES OSCILLATING MOTION
PROVIDES MAXIMUM EFFICIENCY IN SIZING MATERIALS

One of the most efficient vibrating screens ever built. Heavy construction throughout plus simplicity of adjustment. Can be tilted at any desired angle with either turn buckles or rigid supports.

Screens available in wire mesh, punched steel plate or manganese plate. Specially adapted for the handling of rocks mixed with colloidal materials. Can be used for scalping from large jaw type or gyratory crushers.

Drive belt enclosed in special covered housing for protection from dust, dirt and water. Can be operated at variable speeds to suit type of material being screened. Can be built fully covered to prevent escaping dust.

Send for bulletin describing the full line of KVS screens

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION
TWO PARK AVENUE, NEW YORK 16, N. Y.

Serving the Non-Metallics

. . . the Raymond ROLLER MILL

Partial list of non-metallics ground with Raymond Roller Mills

Gypsum
Limestone
Bentonite
Barytes
Fuller's Earth
Dolomite
Magnesite
Bauxite
Ceramic Clays
Kaolin
Marble
Phosphate Rock
Sulphur
Talc
Coal

Built in Two Types...

HIGH SIDE ROLLER MILL

with Whizzer Separator for High fineness grinding to 99.9% or better passing 325 mesh.

LOW SIDE ROLLER MILL

for medium fine grinding to about 95% passing 100 mesh.

For complete Roller Mill information write for Catalog No. 61.

COMBUSTION
Sales Offices
In Principal Cities

Industry for more than 60 years

FINENESS RANGE

About all passing 20 mesh to 99% or better for passing 325 mesh.

CAPACITY RANGE

From a few tons to 30 or more tons per hour.

MOISTURE RANGE

Initial surface moistures as high as 10% or 12% in some cases may be handled by Flash Drying.

The Raymond Roller Mill with its long record of dependable performance and constant improvement over the years, offers many advantages for pulverizing nonmetallic minerals.

These units are noted for their ease of fineness adjustment and consistent finished products at any fineness specification. Other advantages of Raymond Roller Mills include:

New type feed control, maintains peak operating capacity, and assures highest tonnage per horsepower.

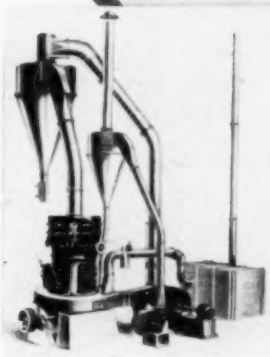
High efficiency air separation.

Dustless operation.

Heavy, rugged construction for long service life.

Ability to simultaneously grind and dry materials with Flash Drying accessories in a single continuous process without use of separate dryers or conveyors.

Raymond Roller Mills are adaptable to practically any floor plan or building layout with assurance of record-low production costs. Let Raymond experience help you solve your grinding problems without obligation.



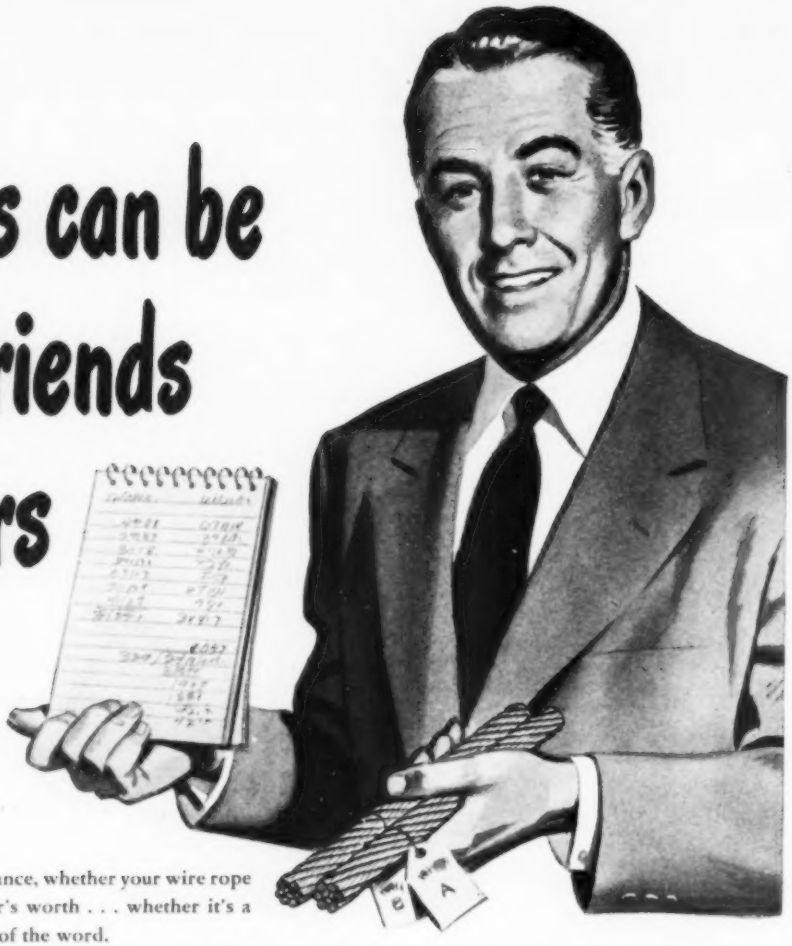
MOISTURE REMOVAL

Typical arrangement of Roller Mill with Flash Drying accessories.

ENGINEERING-SUPERHEATER, INC.
RAYMOND PULVERIZER DIVISION
1321 NORTH BRANCH STREET • CHICAGO 22, ILLINOIS

SINCE 1887

Figures can be good friends of yours



They can tell you, for instance, whether your wire rope is giving you a big dollar's worth . . . whether it's a bargain in the true sense of the word.

They can tell you the total amount of work it does in its life, and the cost per unit of work—the only *true* cost. Bethlehem strongly suggests you keep figures on wire-rope performance, so that you will know at all times which brand of rope is doing the best, most economical job for you.

Obviously, we feel that Bethlehem rope will stand out in any such comparisons. We welcome comparisons as a means of proving the basic economy of Bethlehem rope—economy every user can prove with a simple system of records.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

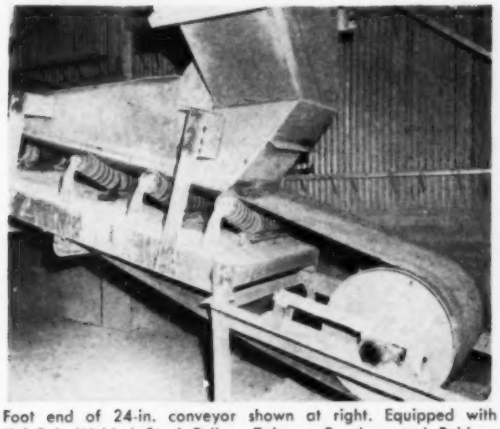
LET YOUR RECORDS TELL YOU!

LINK-BELT Belt Conveyors
Handle High Tonnage Efficiently!

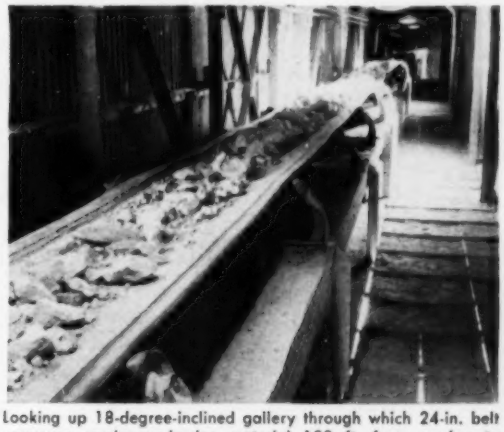
42-in. troughing-type conveyor carries limestone to trommel. Conveyor rises 25 ft. in 94 ft. horizontal distance. Supported by Link-Belt Roller Bearing Idlers and powered by Link-Belt Herringbone Gear and Steel Roller Chain Drive.

Smooth, constant flow of material, so essential to volume production, is realized at this limestone preparation plant through the employment of belt conveyors by Link-Belt. And the outstanding feature of these conveyors is their ability to maintain that high volume with minimum power and maintenance expense. Over 50 years of progressive engineering and constantly improved manufacturing methods make Link-Belt Belt Conveyor Equipment the best you can buy. Link-Belt Idlers increase belt life, run trouble-free—they eliminate almost all friction wear, turn freely on positive-grease-seal roller bearings. Link-Belt Enclosed Gear and Chain Drives provide highest mechanical efficiency. Link-Belt Apron and Belt Feeders assure uniform safe loading. And Link-Belt engineers can coordinate these and other top-performance Link-Belt Conveyor Equipment in adjustments or installations of any size, to suit the exact needs of your own plant.

(The limestone preparation plant in these photographs was completely engineered and built by Link-Belt)



Foot end of 24-in. conveyor shown at right. Equipped with Link-Belt Welded Steel Pulley, Take-up Bearings and Rubber-tread Impact Idlers that save belt from breaks, cuts and too heavy wear by absorbing shock of falling loads.



Looking up 18-degree-inclined gallery through which 24-in. belt conveyor carries undersize material 180 ft. from crusher to separate screening plant.

LINK-BELT COMPANY

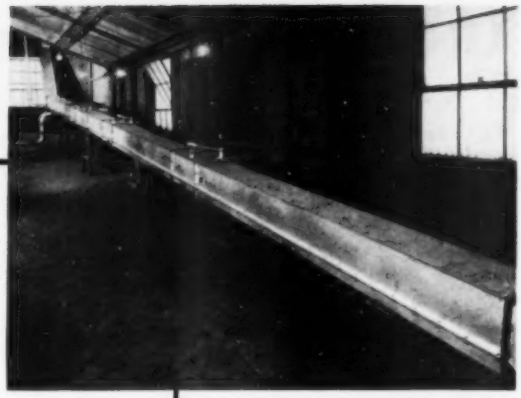
Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Johannesburg. Offices in Principal Cities. 12.139

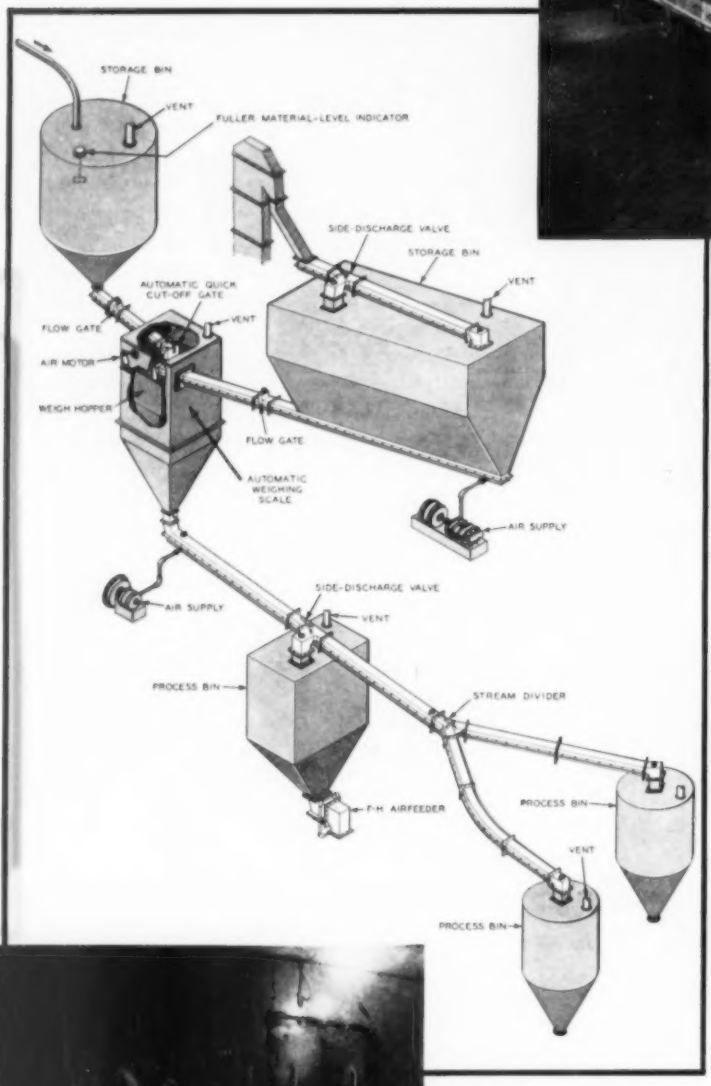
LINK-BELT

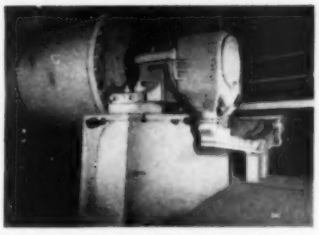
BELT CONVEYOR EQUIPMENT

IDLERS • TRIPPERS • BELTS • PULLEYS BEARINGS • DRIVES

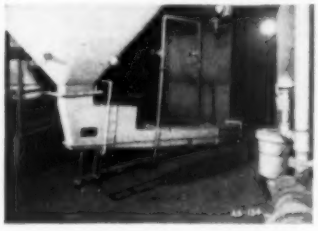
Right: Enclosed type Airslide conveying cement raw material from pulverizers to storage. Shows three side-discharge valves, which may be set either to direct entire material flow through one spout, or divert any portions of the stream to obtain a desired distribution to bin below floor. Bin is shown in photo, lower left.



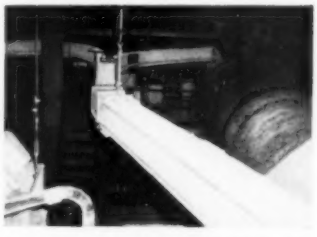




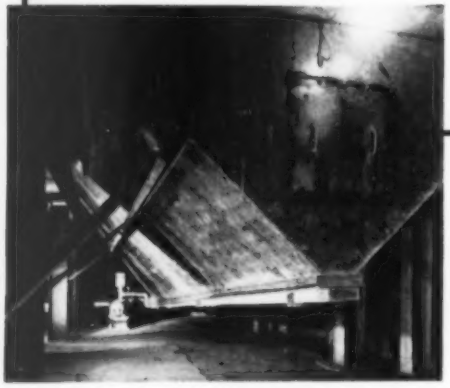
Airslides conveying raw-materials from two pulverizers and delivering to a screw conveyor.



F-H Airfeeder and Airslide conveying raw material from bin to elevator



Airslide, conveying air-separator tailings, split to return an accurately divided stream to two finish mills.



Left: Open type Airslide installed in bottom of storage and blending bin. Blower in background furnishes air for this Airslide. Capacity of Airslide, 90 tons an hour.

Many arrangements possible ...with F-H AIRSLIDE

The drawing on the opposite page illustrates how the F-H Airslide Conveyor, with its various accessories, can be applied to the conveying and feeding of fine, dry materials from bins of various types and construction; delivering to an automatic-weighing scale, proportioning different materials, and delivering to process bins in the proper predetermined quantities.

Referring to the cylindrical bin with a cone bottom, upper left-hand corner . . . air from the inlet end of the Airslide enters upwardly through the bin outlet and promotes flow of material from the bin to the Airslide, which, in turn, conveys the material to the weigh-hopper of the scale. The flow gate is normally set to control the rate of flow of material from the storage bin to the weigh-hopper, in accordance with the desired rate of filling the weigh-hopper. It can also serve as a manually operated cut-off gate.

The automatic quick cut-off gate, at the discharge end of the Airslide, which is actuated by the air-motor, cuts off the flow of material to the weigh-hopper when the scale beam is in balance. The operation of the air-motor is controlled by a solenoid operated air valve which, in turn, is controlled by an electrical contactor on the beam of the scale.

The Airslide, with its accessory equipment, serves the dual purpose of conveying to, and feeding the scale, at a controlled rate, without the use of complicated and expensive equipment, such as rotary feeders, inclined screw feeders, etc. The fluidization of material at the discharge of the bin prevents arching in the bin, which would normally result in starving the scale. With arching eliminated, there is no flooding, which would normally occur when arches break down. All this gives the desired result of feeding the scale in such a manner that it can perform its function of weighing accurately.

At the top, right, is illustrated a bin of a type or shape frequently used in many industries. Distribution of material over the length of the bin is relatively simple and can be accomplished by means of the enclosed-type Airslide, and accessory equipment. The accessory featured is the side-discharge valve, which can be set to divert the entire stream, or any part of the stream through the valve, or by-pass the bin inlet served by the valve.

Discharge of material from a bin of this type is quite difficult to accomplish with conventional types of equipment. However, by simply applying Airslide equipment of the open type to the bin bottom, the entire content of the bin can be discharged without the use of bin compartments, or hoppers, gates, feeders, or power-driven conveying equipment. Since the bottom surface of the material load in the bin is exposed to aeration and movement, promoted by the Airslide, the tendency for the material to form arches is overcome, and complete discharge of material can be accomplished. Beyond the bin, the open-type Airslide delivers the material to a section of enclosed-type Airslide, which, with its accessory equipment, performs the same functions outlined previously for the conveyor from the cone-bottom bin.

At the bottom of the hopper, underneath the scale, an enclosed-type Airslide, having several functions, is illustrated. The primary purpose is to show how the Airslide can be employed to convey weighed quantities of material to remote destinations, for further processing. In this system two types of accessory equipment, i.e. the side-discharge valve and the stream-divider are employed to perform similar functions, but to serve a different arrangement of process equipment. The rectangular process bin can function as a unit, receiving a weighed quantity of material, which is fed out at a rate determined by the setting of the F-H Airfeeder.

The conveying system employing the stream-divider, serving two branches, delivering material to similar process bins, shows how the Airslide can be used in the preparation of batches of known weight for further processing. The use of duplicate process bins makes it possible to discharge one bin while the other is being filled with the proper batch, which may consist of more than one material, since the two storage bins serving the scale may contain different materials, which form component parts of a mix.

The side-discharge valve and stream-divider, as illustrated, are for manual operation but can be furnished for automatic remote control. By means of the control furnished with the scale and that furnished with the Airslide equipment, it is possible to perform all the operations outlined automatically by remote control.

You will note that the air supply units illustrated differ in appearance. This is due to the fact that pressure under which air is supplied to the open-type Airslide is considerably higher than that required by the enclosed type. For the open-type Airslide to function properly, under a head of material, it is essential that the aeration extend to a reasonable height above the Airslide. The air supply unit is therefore designed to overcome the resistance to flow of air, caused by the Airslide and a portion of the static head of the material above the Airslide. For this purpose a positive-pressure blower is used. The enclosed type of Airslide is normally not subjected to a head of material, the normal depth of stream being conveyed is not in excess of 4 inches. For such an operation, the plate-type fan is used.

Other points of interest are the different methods of conveying material to the storage bins, served by Airslide equipment. In one case the material is supplied through a pipeline, which could be a Fuller-Kinyon or Fuller-Fluxo conveying system. The conventional bucket elevator is also shown. Note that the Airslide can be furnished in curved sections.

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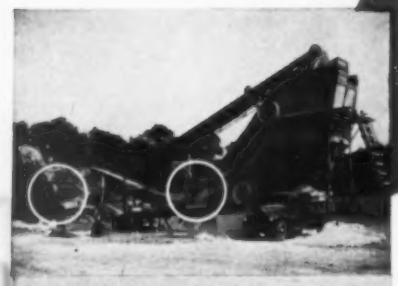
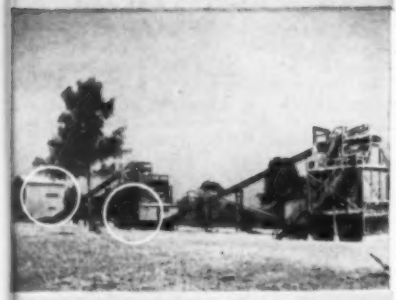
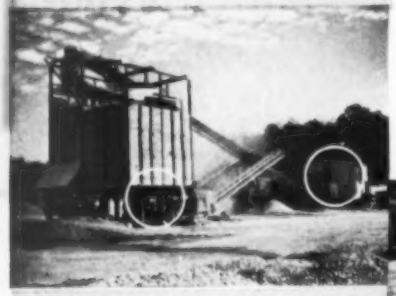


SEMI-PORTABLE PLANT, producing agricultural limestone and road rock.



STATIONARY PLANT, producing agricultural limestone and several sizes of crushed rock.



STATIONARY PLANT, producing concrete aggregate, road rock and agricultural limestone.

PORTABLE PLANT, crushing creek gravel for road surfacing.

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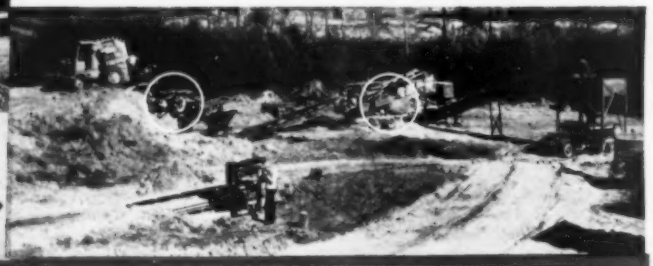

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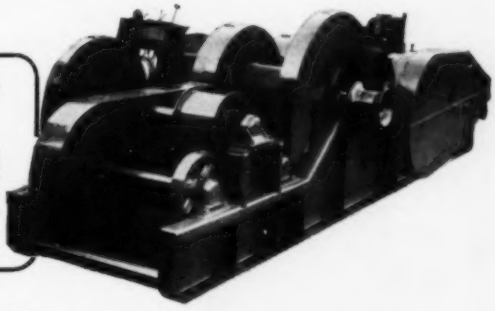

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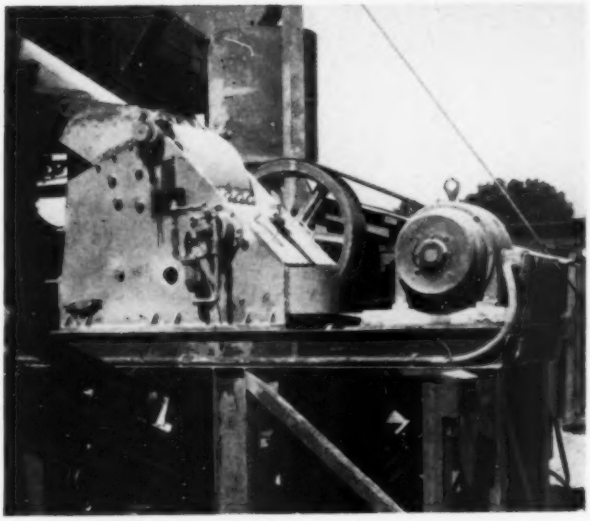
KUE-KEN* CRUSHERS GIVE HIGH CAPACITY *Low Cost* CRUSHING

Turlock Rock Company selects a Kue-Ken Jaw Crusher for its High Capacity Low Cost Crushing.

At right is shown a #54 Kue-Ken Crusher installed at Turlock Rock Company. Feed is hard 6" river boulders crushed down to 1½". Rock goes to screen and minus ¾" is removed. Plus ¾ to 1½" goes to gyratory.

All around savings were made by installation of a Kue-Ken Jaw Crusher. Costly stockpiling of over-size was eliminated, as gyratory only took up to 2¼-3½" rock. Smaller feed increased gyratory capacity and reduced costly maintenance and excessive wear.

Kue-Ken principle of "crushing without rubbing" gives 5 to 10 times longer jaw plate life, usually 2 to 3 times more capacity with far less power. Kue-Ken Crushers deliver 50-60% more crushing strokes than old style crushers. More crushing strokes per minute means greater capacity — more evenly crushed rock for all Kue-Ken users.



#54 Kue-Ken 24" x 8". Note: Balanced construction eliminates necessity of heavy fly wheels and needless dead weight to reduce vibration. Only one drive wheel required. No massive foundation needed.

22 Sizes 12" x 7" to 48" x 60"

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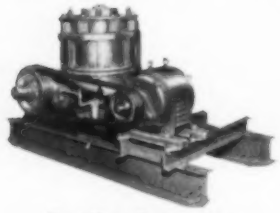
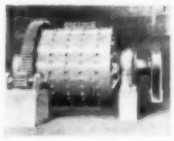
Licensed manufacturer for Eastern U. S., Canada and Puerto Rico: Pennsylvania Crusher Company, Broad and Arch Sts., Philadelphia, Pa.

LET KUE-KEN WORK FOR YOU



Kue-Ken Gyracone

Overstrom Screens



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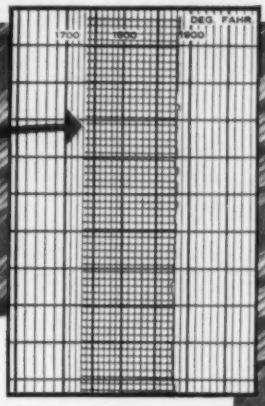
ALL ROPES *look* ALIKE... but

IN *Wickwire Rope*

GRAIN SIZE OF STEEL IS ALWAYS UNIFORM



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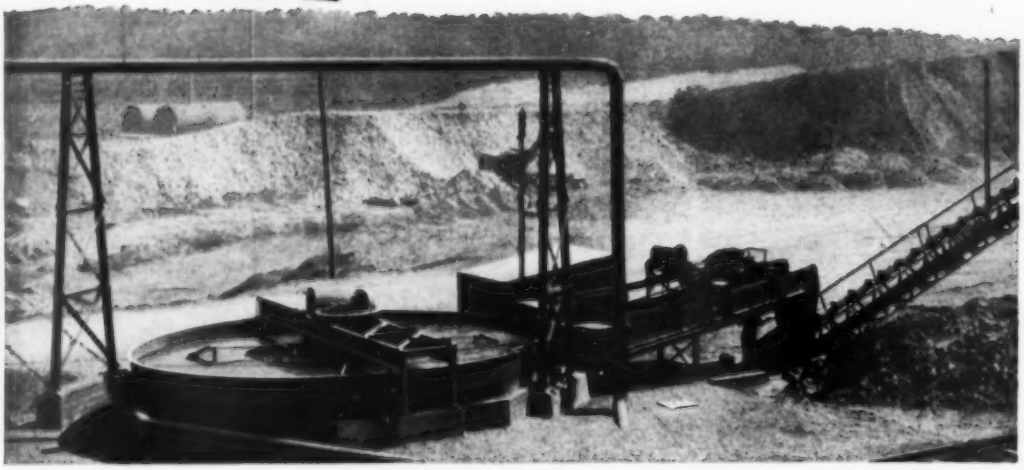

The DORRCO BOWL DESILTOR in operation

Pictured above is a Bowl Desiltor recovering saleable agstone from a stone washing operation at G. & W. H. Corson, Inc. near Philadelphia, Pennsylvania. The bowl is 26 ft. in dia. and the Classifier is a duplex model with 5 ft. wide by 30 ft. 4 in. long rakes. Feed averages 600 gpm containing 3-4% solids of which 95% is minus 100 mesh material and approximately 50% is minus 325 mesh. 88% of the plus 325 mesh material is recovered as a rake product containing 25% moisture. Average overall recovery is 55 to 60% amounting to 3 to 4 tons per hour.

If you have a washing operation and these results sound interesting, a Dorr engineer will gladly supply more information on the Bowl Desiltor.

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Mr. Sholseth says, "We have good luck with all our Internationals. The oldest one on the job (8,000 hours of work) hasn't even had the pan removed from the crankcase as yet."

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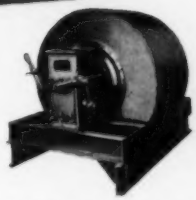

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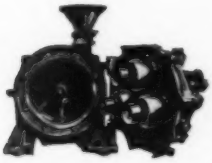

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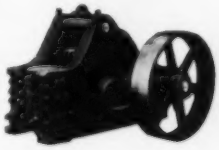

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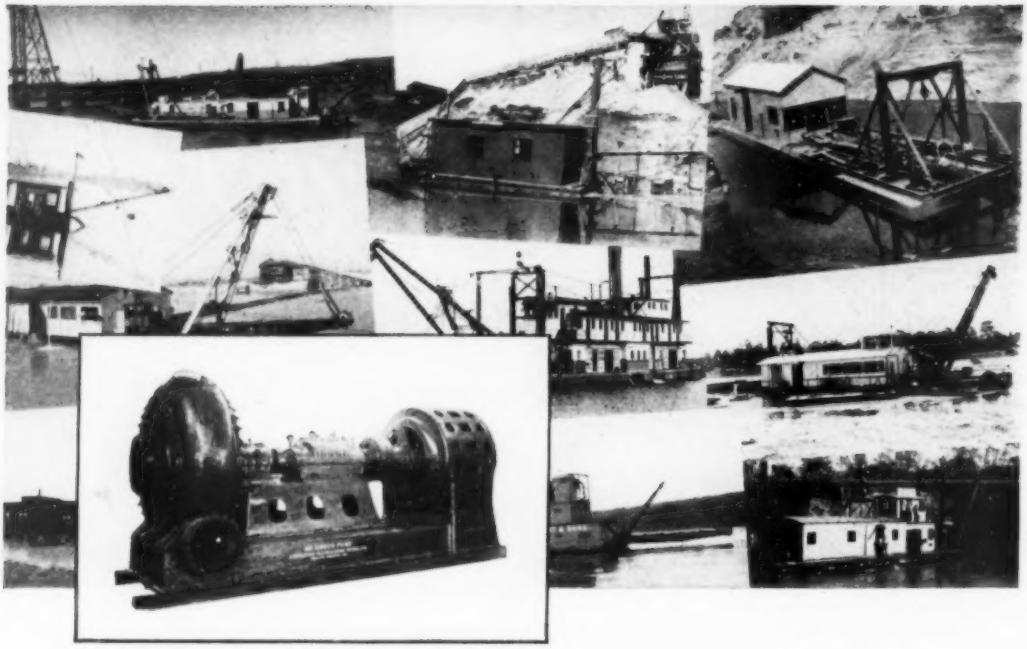

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PIT AND QUARRY

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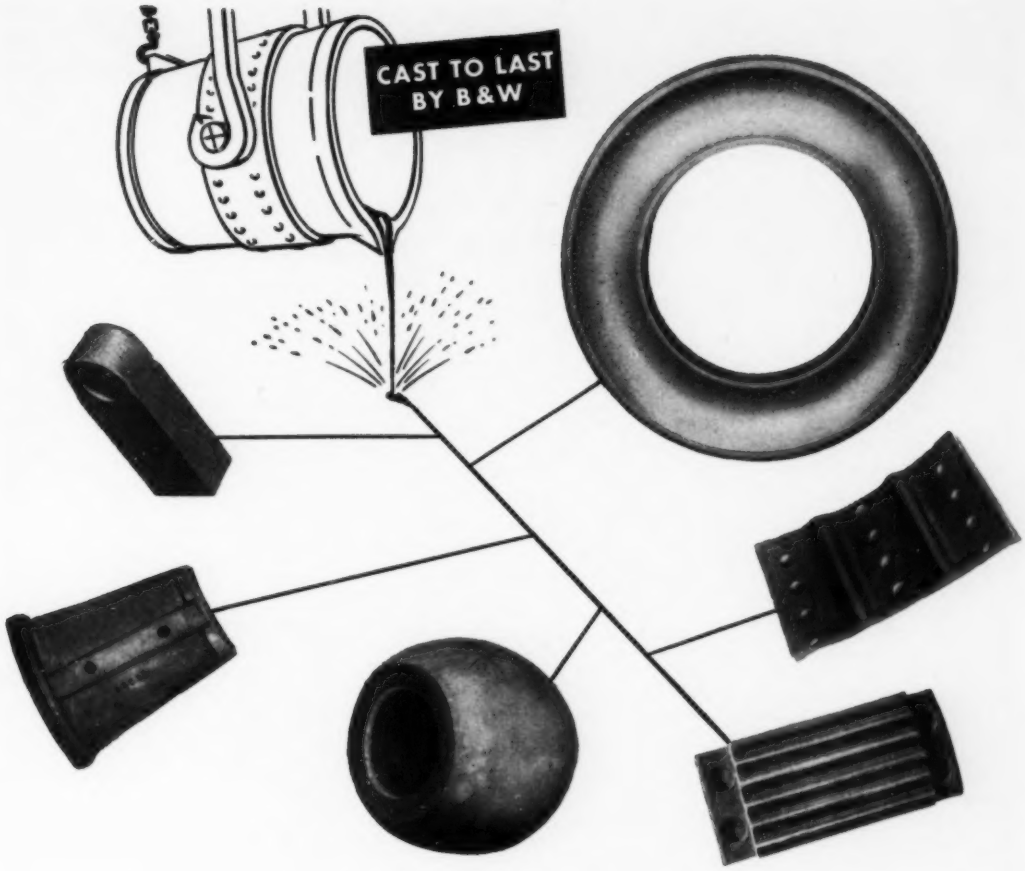

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editorial

Ban on Non-Essential Construction

THE National Production Authority has issued three orders effective at midnight on October 26, which are major steps toward war-time control over our economy. The first order bans the construction of new buildings for amusement, recreational or entertainment purposes. This will have an immediate effect on the demand for many non-metallic minerals and their related products, some of which have been in short supply. The second order directs the steel industry to furnish steel for the manufacture of at least 10,000 freight cars per month. The third step was an amendment to the NPA steel distribution order which will permit allocation of steel to the petroleum and mining industries, farm machinery makers, and other defense-supporting industries.

The building ban applies specifically to 44 different kinds of construction, including amusement parks, race tracks, theaters of all kinds including drive-ins, stadiums, assembly halls used primarily for recreation and amusement, etc. It applies to federal, state and city recreational buildings as well as to private projects. The wording of the order makes it clear that the NPA will enforce its ban against any amusement building regardless of whether the type is specifically mentioned on the list.

According to William H. Harrison, national production administrator, the purpose of the order is to "conserve important materials, particularly certain metals in short supply, for national defense needs." In a statement accompanying his action Mr. Harrison said that the barred construction "is of a type which does not further the defense effort, either directly or indirectly, and does not increase the nation's production capacity."

Anyone starting the construction of other buildings that do not further the defense effort—even though they are not on the prohibited list—runs the risk of being barred from completing such buildings. According to Mr. Harrison such construction may be halted "even though its commencement at the present time is not forbidden by this order."

It is understood that the order does not apply to apartment houses and other dwellings but, according to NPA officials, the law and the policy statement are broad enough to cover such construction if drastic conservation of building materials should become necessary.

The order does not stop construction already under way and permits repair and maintenance of existing buildings in addition to a limited amount of alteration and modernization. Small projects costing $5000 or less during any year are exempted. Also exempted is all construction by the Defense Department and the Atomic Energy Commission. Provision is made for exemption if a builder or owner can show that the order works "substantial hardships" on him.

Builders may decide for themselves whether or not they are permitted to complete structures already begun but can be punished by fine or imprisonment or both if they violate the intent of the order. On new construction they may finish the job if they have already begun pouring or placing of footings or foundations; on remodeling jobs if they have put in place permanently any additional building materials.

The general policy on future controls is stated in the order as follows:

"It will be the policy of NPA to further limit or prohibit construction of additional types of projects which do not further the defense effort or increase the nation's productive capacity when such action is deemed necessary in the interest of national defense to minimize material shortages.

"If such action becomes necessary, any such construction commenced after the effective date of this order may be halted, even though its commencement at the present time is not forbidden by this order."

The Draft and Manpower

THE recent favorable developments in Korea have helped to create the impression in some quarters that the scheduled expansion of our armed forces to 3 million men will not be considered necessary and that the rate at which men are being drafted will be slowed down. According to informed sources there is no prospect of such curtailment: all indications make it plain that our government is in deadly earnest about its intention to build up our standing army, navy and air strength to a point where any potential aggressor against peace in any part of the world will think twice before committing overt acts.

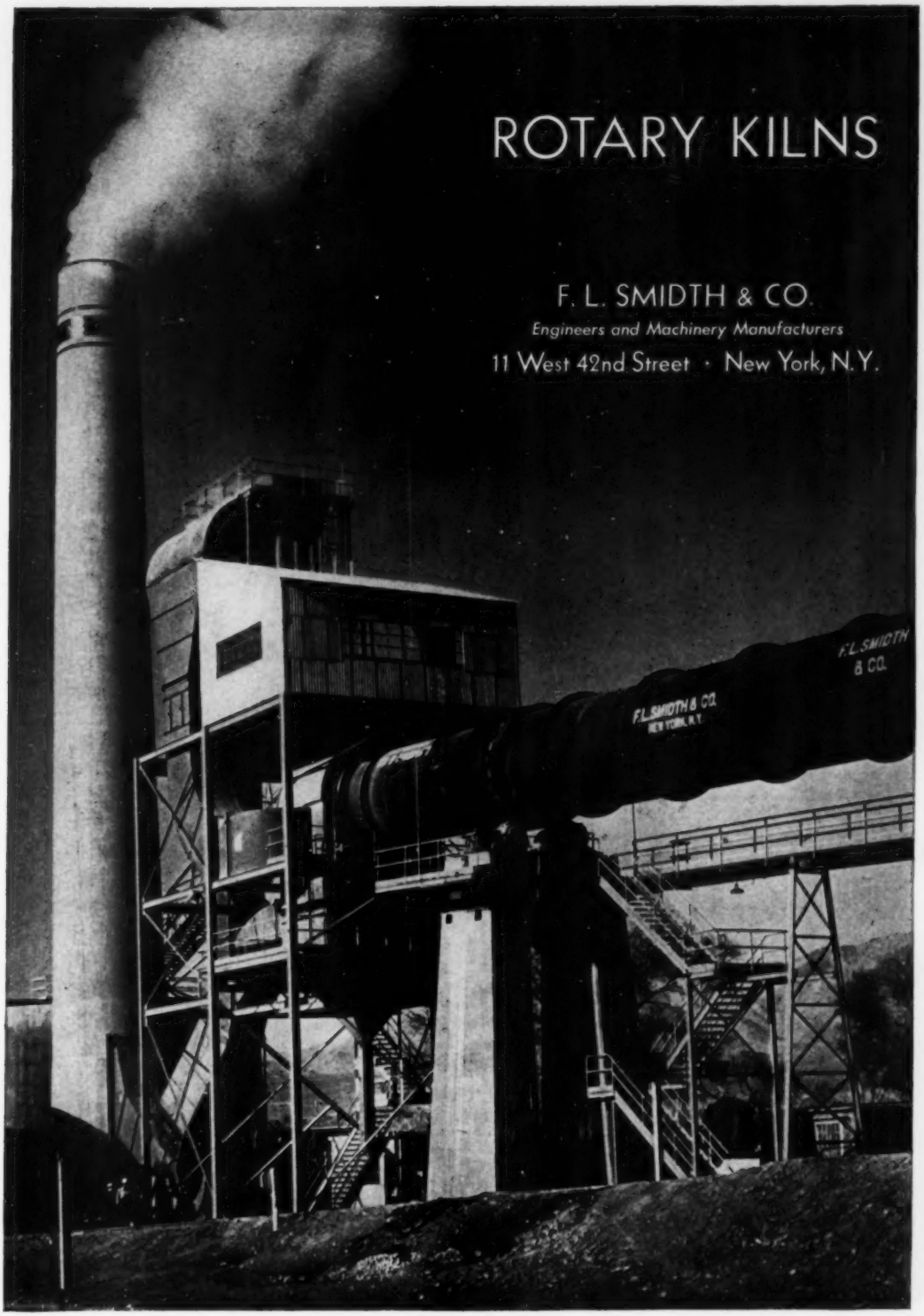
Industry is again urged, as it was several months ago when the draft began, to keep a close watch over draft and military service regulations and to determine which workers can expect draft deferment and which may be lost to the armed forces.

Where an industrial deferment is desired it is imperative that the employer file a statement requesting deferment before the individual has been classified before his local board. Employers should file immediately on those employees who have already been classified. These requests should be filed with the local draft boards.

In the case of reservists the first application for deferment should be made by the individual to his local area commander. If the application is denied at the area level the reservist has a right to appeal for a review of his application. All branches of the service are using as a guide for occupational deferment the critical occupations list prepared by the Department of Labor.

Industry is also advised that the need for making an accurate appraisal of the manpower situation is still urgent and, if not already undertaken, it should be started immediately. In addition to determining the possible loss of manpower to the armed services, management is urged to consider ways and means for obtaining necessary replacements. The employment of over-age and handicapped workers for some types of jobs is recommended.

Walter E. Trauffer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news of the industry

PIT AND QUARRY

1,500,000 Bbls. per Year Marquette's Goal in Plant Expansion at Des Moines

Marquette Cement Manufacturing Company officials have announced that the capacity of the company's Des Moines, Ia., plant will be increased 50 percent, to produce a total of 1,500,000 barrels of cement annually beginning May 1, 1951. The plant currently produces 1,000,000 barrels of cement yearly for the Iowa market and portions of Minnesota, North Dakota and Nebraska. The greater part of its sales is handled by the Marquette subsidiary, Hawkeye Portland Cement Company, whose offices in Des Moines are headed by President G. F. Hetherington.

Marquette's Vice-President D. S. Colburn stated that economically favorable negotiations have just been completed for the purchase of much of the necessary new equipment from the China Portland Cement Company of Shanghai, China. This equipment, including a 475-ft. kiln, had been fabricated in this country for China Portland, a private concern which produces cement in China. The abandonment of an expansion project by that company, due to the political and military upheaval there, left the equipment crated in U. S. ports and in Hongkong, China. The machinery, now Marquette's property, is being cleared for prompt shipment to Des Moines and will be in operation at the Marquette plant there "in time to help meet the heavy demand for cement at the outset of the construction season next Spring," Mr. Colburn stated.

The new installation at the Marquette plant in Iowa will be operated only during the seven warm-weather months, the season of heavy demand each year, when a plentiful supply of natural gas is also available for kiln firing, it was stated by Frank Moyle, Marquette's director of operations. Existing storage, packing, and loading facilities are adequate to handle the new additional capacity from this plant, Mr. Moyle added.

This expansion of the Des Moines plant will tend to relieve the current scarcity of cement in the area and accelerate the servicing of orders, which are now shipped in part from the Marquette plant at Oglesby, Ill., according to S. L. Cribari, vice-president in charge of sales. With this additional capacity at Des Moines, the cement heretofore shipped into the area from Oglesby will now be released to meet equally heavy construction demands in Illinois and Wisconsin.

At Mitchell, Ind., each man in the Lehigh Cement Company's plant recently got a new pair of safety shoes. It is a custom to distribute free footwear each time the plant has been operated 365 days without a lost-time accident. When they work 1,000 days without an accident they get watches.

Coming Events

January 16-18, 1951 — Washington. National Agricultural Limestone Association, Statler Hotel.

January 22-25, 1951 — Cleveland. 31st annual meeting and exhibit, National Concrete Masonry Association. Cleveland Auditorium.

January 28- February 1, 1951— Chicago. 32nd annual meeting, Associated Equipment Distributors. Stevens Hotel.

February 5-7, 1951 — Cincinnati. 34th annual convention, National Crushed Stone Association and 6th annual convention, Agricultural Limestone Institute. Netherland Plaza Hotel.

February 11-15, 1951—New Orleans. 35th annual convention, National Sand and Gravel Association and 21st annual convention, National Ready Mixed Concrete Association. Roosevelt Hotel.

March 1-3, 1951—New York. 43rd annual convention, American Concrete Pipe Association. Waldorf-Astoria Hotel.

Big Rock Stone & Material Purchased by 3M— To Become Subsidiary

R. P. Carlton, president of the Minnesota Mining & Manufacturing Co., has announced that his firm has purchased the Big Rock Stone & Material Company in Little Rock, Ark. The Minnesota concern has operated a roofing granule plant in Little Rock since 1947.

The sale included Big Rock quarry in North Little Rock and the general offices and retail plant for crushed stone, sand, and ready-mix concrete in Little Rock. The price was not disclosed.

R. S. Wilson Sr., president of the Big Rock Stone & Material Co., will continue as active head of the company's management, Mr. Carlton said. He added that no major changes in operations are contemplated. Big Rock, which employs about 140 persons, will operate as a wholly-owned subsidiary of 3M.

Minnesota Mining's roofing granule plant in Little Rock, with an annual capacity of 200,000 tons of finished granules, has 190 employees. This is enough to roof 600,000 homes.

Sulphur, Phosphate Lands To Be Mined by New Firm

Sulphur deposits in the Cody country of Wyoming and phosphate lands near Lander will be developed by a newly-formed company, the Continental Sulphur and Phosphate Corporation, whose headquarters are in Dallas, Tex.

It was reported that examination of the sulphur deposits showed a supply adequate for at least 30 years, with production geared to 200 tons per day. It is estimated that a plant to process the ore will cost approximately $2,000,000.

Phosphate reserves at Lander are estimated to contain 20,000,000 tons, according to a U. S. geological survey. A 200-ton-per-day plant to produce concentrated phosphate would cost about $3,750,000. Bids for both plants have been received, and a market has been found for the entire output of the facilities.

Continental Sulphur and Phosphate is seeking the aid of the U. S. Department of Agriculture, the Department of the Interior, and the Reconstruction Finance Corporation in developing its program.

New Federal-Aid Act Authorizes $500,000,000 For 1952 and 1953

A bulletin released by the National Crushed Stone Association calls attention to the major provisions of the Federal-Aid Act of 1950, recently enacted into law, which authorize $1,000,000,000 in federal-aid funds for highway construction for the fiscal years 1952-53.

The new legislation represents an increase of $50,000,000 annually from the current rate of federal aid and makes available an additional $100,000,000 in the two-year period, which when matched by the states will make possible a $200,000,000 expansion of the record-breaking postwar highway program.

Authorizations provided in the Act which are of major interest to crushed stone producers include the following for each of the two fiscal years: $225,000,000 for federal-aid primary roads; $150,000,000 for secondary roads; $125,000,000 for the federal-aid urban system.

An important change in the new legislation provides for the use of federal-aid funds for retirement of bonds issued by states, counties, and other political subdivisions to accelerate the construction of toll-free facilities on the federal-aid primary and urban systems.

Sand Barge Skipper Lost As Vessel Capsizes in Lake

Tragedy struck the Kelley Island Lime and Transport Company of Cleveland, O., on October 16 when its 161-ft. sandsucker the *John M. McKerchey* sank in Lake Erie, near Lorain. Nineteen members of the crew were rescued, but Captain Horace Johnson, 46, of Monroe, Mich., went down with his ship. The *McKerchey* carried a load of 700 tons of sand.

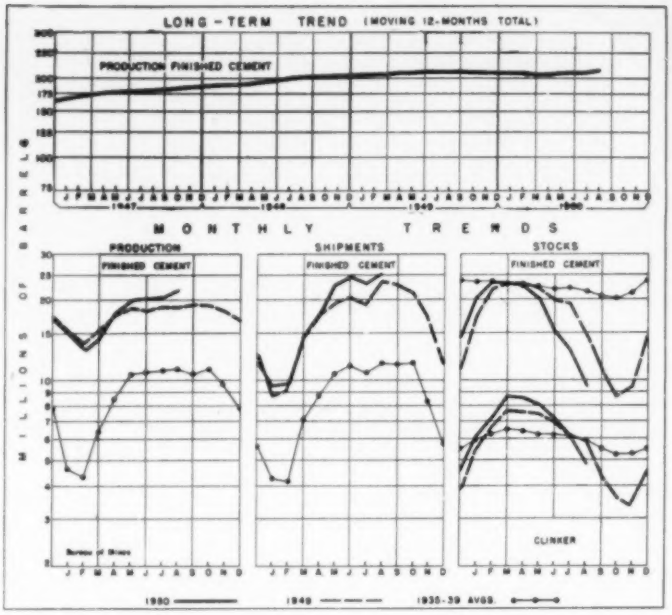
Crewmen stated that the vessel began to leak on the way to Lorain on the preceding night, and capsized when only about 15 minutes from the port.

A.R.B.A. Membership Drive, Road Show Plans Discussed

Washington, D. C. was the scene of a meeting of the board of directors and committees of the American Road Builders' Association held on September 14 and 15 to discuss ways and means of strengthening the organization and broadening its membership base. At this meeting it was decided that the traditional "Road Show" will be held at the earliest possible date, just as soon as the international situation permits planning sufficiently far in advance to allow making of firm commitments regarding exhibits and hotel and convention arrangements.

The A.R.B.A. also announced plans for a full-scale membership campaign to aid their program for stepping up the highway construction and maintenance program.

Another action taken at this meeting was to combine the annual banquet scheduled to conclude the A.R.B.A. annual meeting at the Hotel Schroeder in Milwaukee next March 14 with the annual dinner of the Wisconsin Road Builders' Association, which will conduct its annual meeting immediately following the A.R.B.A. sessions.



SUMMARY—The portland cement industry produced 21,884,000 barrels of finished cement in August, 1950, as reported to the U. S. Bureau of Mines. This total represents an increase of 17 percent over that reported for August, 1949. Mill shipments reached 25,144,000 barrels—6 percent above the August, 1949, total, while stocks on August 31, 1950, were 33 percent below the August, 1949, figure. Clinker output during the month amounted to 20,678,000 barrels—an increase of 13 percent over the corresponding month of 1949.

PRODUCTION—The output 21,884,000 barrels of finished cement in August, 1950, came from 148 plants located in 35 states and Puerto Rico. In the same month of 1949, 18,715,000 barrels were produced in 146 plants. Clinker production was up 13 percent from the August, 1949, total.

SHIPMENTS—Mill shipments of 25,144,000 barrels increased 6 percent over the total reported for August, 1949. The demand for cement, as indicated by mill shipments, increased substantially over that of the previous month's (July, 1950) total of 23,167,000 barrels. Shipments were greater in 13 districts and smaller in 6 districts than those recorded for August, 1949. The percentage changes range from a decrease of 10 in the Kansas district to an increase of 37 in the Colorado-Arizona-Wyoming-Montana-Utah-Idaho district. Shipments increased 182 percent in the Puerto Rican district.

STOCKS—Stocks of finished cement on August 31 amounted to 9,588,000 barrels—33 percent below the August, 1949, total, while clinker stocks amounted to 4,815,000 barrels—or down 17 percent from the same month of the previous year.

$10,000,000 Asbestos Plant In Ontario Will Employ 2,500

Additional data on the Canadian Johns-Manville Company's asbestos mine and plant at Matheson, Ont., opened on September 20 (see October issue of PIT AND QUARRY, page 53), reveals that the cost of the facilities, when completed will reach $10,000,000.

The property has been developed for open-pit operation; and a rock-crushing plant, a mill and other buildings have been completed and equipped. Work will be provided for 2,500 men.

Seven 15-ton trucks, operating 24 hours a day, haul asbestos from the open pit to the crushing plant. The pit is 35 ft. deep and extends several hundred feet along the main orebody. The company also has staked claims in surrounding sections of the township.

At Iola, Kan., the Lehigh Portland Cement Company has under construction a two-story addition to the plant laboratory, which until now has occupied a large part of the second floor in the office building. The "old" laboratory is being completely remodeled by the installation of modern lighting, plumbing, and other equipment.

Additional information received concerning the Marquette Cement Manufacturing Company's proposed new multimillion-dollar plant at Brandon, Miss., reveals that the big setup will utilize the wet process. Marquette will install a 450-by 12-ft. gas-fired kiln.

Iranian Cement Firm To Get Huge Shipment Of American Machinery

The largest shipment of cement plant machinery ever to leave New York on a single steamer started on its way September 26, a part of the 60,000 metric-ton capacity plant which the Kennedy-Van Saun Manufacturing and Engineering Corporation is currently shipping to Iran as part of that country's $650,000,000, seven-year development plan. When finished next summer, the plant will represent a total investment of around $6,000,000, according to Byron H. Pyle, vice-president of Kennedy-Van Saun.

This shipment included three 1,000-kilowatt generators and a complete waste heat boiler for the power plant. Electric current output will be sufficient to provide illumination and power for a model city at Shiraz, in addition to the current requirements of the cement plant. This is the first big industrial plant in the development plan, and will use native limestone and raw materials to produce cement at costs between 15 and 20 percent lower than prices of imported cement in Iran.

Earlier this year other shipments were made including conveyors, crushers, and construction equipment for the building foundations. The installation is being made by the Fars Cement Company of Iran, a privately-owned business, aided by substantial government loans.

The new facilities will use American standards throughout on all mechanical and electrical equipment. American engineers and construction men are supervising the erection of the plant and are using local Iranian labor. Early surveys of raw material indicated that there is a 50-year supply of high-grade limestone available near the plant site.

Latham Gray of the Kennedy-Van Saun organization will be in charge of the erection of the plant. He is now in Italy supervising the building of a new cement plant for Itali Cementi, scheduled for early completion.

New Mill in Salt Lake City Will Make Catalytic Agents

The Filtrol Corporation of Los Angeles, a subsidiary of the Standard Oil Company of New Jersey and Atlantic Refining Company, will definitely go ahead with construction plans for a $2,500,000 mill to be located at 1710 S. Redwood Road, Salt Lake City, Utah.

The operations, using Utah halloysite clay for the manufacture of oil refinery catalytic agents, is expected to require up to 2 acre-feet of water per day. Clay will be obtained from the Eureka district.

According to a Parsons, Kan., publication, a contract specifying an increase of 8 cents per hour for all employees paid on an hourly basis was signed by the Lehigh Portland Cement Company and union officials at the Iola, Kan., plant. The pay current range is from $1.18 to $1.65 per hour.

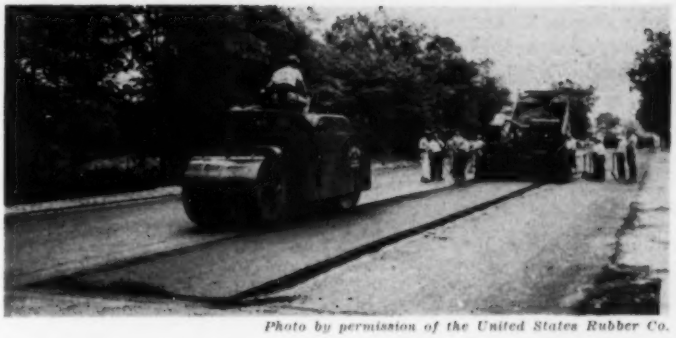


Photo by permission of the United States Rubber Co.

• The accompanying illustration shows workmen installing a section of the longest "rubber" highway in existence, a 5½-mile stretch in Massachusetts between the Rhode Island line and North Attleboro. The pavement is a combination of stone, asphalt, and a new meltable rubber compound developed by the Naugatuck Chemical Division of the United States Rubber Company. It was laid over an old concrete surface. The base is a 1¼-in. layer of heavy stone, rubber, and asphalt; the top is a 1¼-in. layer of fine stone, rubber, and asphalt. The pavement is expected to cut maintenance costs, which were as high as $1,000 per mile annually, to a new low.

Brazilian Cement Shortage Eased by Import Licenses

The Import and Export Control Department of the Bank of Brazil, a government financial institution, has announced that industrial firms desiring to import raw materials for their own use in the future may be granted import licenses, despite the fact that they are not usually importers of such materials.

This step was taken to ease the cement shortage in Brazil, which has virtually halted industrial and housing construction in Rio de Janeiro. Under the new regulation builders will be permitted to import cement.

Base Pay Rises Each Time Cost-of-Living Index Does

168 employees of the International Minerals & Chemical Corporation at Carlsbad, N. M., were awarded a wage increase of 2 cents per hour during the month of September. The increase went to those under the jurisdiction of the International Association of Machinists and the International Brotherhood of Electrical Workers.

The wage adjustment was made in accordance with a clause in the working agreements with the two unions which provides for an increase in base pay of 1 cent for every full point the cost-of-living index rises, to be paid for a month after such price increase has been announced by the Bureau of Labor Statistics. The 2.5 increase of the cost-of-living index published in August therefore called for the 2-cents-per-hour wage hike during September.

Cover Picture....

• This month our cover carries an interesting picture of a portable plant operated by Baulne-Frieske in Pine Canyon near Yardley, Wash. In the foreground a diesel tractor, equipped with a bulldozer feeds the crushing plant. Four diesel engines provide power for the plant.

Sulphur Producers Report Rising Sales, Profits Totals

Production, sales, and earnings of sulphur companies during 1950 show a decided upturn, according to reports released by the concerns. Reflecting this tendency, the Texas Gulf Sulphur Company last summer authorized the payment of an extra of 50 cents and a regular quarterly dividend of 75 cents on the common, both payable on September 15. Similar extra distributions were paid in preceding quarters. Net earnings in the first half of this year total $4.14, as compared with $3.87 in the comparable period of 1949.

Freeport Sulphur Company officials reported a consolidated net income of $3,165,661 ($3.96 a share) for the first half of 1950, as against $3,607,130 ($3.26 a share) for the same period in 1949.

A.E.D. Announces Dates Of 32nd Annual Meeting

Announcement of the 32nd annual meeting of the Associated Equipment Distributors, to be held January 28 to February 1, 1951, at Chicago's Stevens Hotel was made by E. C. Richards, executive secretary.

Those planning to attend the meeting are urged to make their reservations promptly.

September Construction Misses August Mark—9-Month Total Tops '49

Construction contract awards in the 37 states east of the Rockies in September declined from the all-time high figure set in August, but were still high enough to bring the first nine months of 1950 well ahead of the same period in 1949, it was reported by The F. W. Dodge Corporation.

The September award total of $1,286,541,000 was down 17 percent from August's record $1,548,876,000, but was 18 percent higher than that of September, 1949.

The nine-month total of $11,109,746,000 was 50 percent higher than the comparable total for 1949.

The total of square feet of floor area for the first nine months of 1950 was 1,007,231,000, or 63 percent higher than the same total for the January-September period in 1949.

Residential awards in September totaled $549,585,000, a decrease of 27 percent from the August figure, but an increase of 5 percent over September, 1949. Non-residential awards totaled $498,725,000 in September, 8 percent less than the August figure, but 45 percent higher than that of September, 1949.

Public and private works and utilities totaled $238,231,000, 6 percent lower than the August figure, but 7 percent higher than the total for September last year.

N. Y. Coal Sales of Columbus Forms Highland Stone Division

The New York Coal Sales Company, 150 East Broad Street, Columbus, O., has expanded its facilities for producing construction materials of all kinds with the establishment of the Highland Stone Division near East Danville, southwest of Hillsboro, O.

The new division results from the acquisition of the Scott Limestone Quarries in Highland County. Production at this operation alone is expected to run over 200,000 tons the first year. In addition to crushed stone for highway construction, the company will produce agricultural limestone and chemical stone for the steel and chemical industries.

Extensive new equipment will be installed at the Highland County operation soon. This will include a ready-mix concrete plant, an asphalt mixing plant and the latest types of washing and sizing machinery for the various grades of stone to meet state highway and industrial specifications.

G. K. Mitchell, executive vice-president of New York Coal Sales Co., has named his assistant, Robert M. Patton, as the active head of the new Highland Stone Division. He will remain in the home office of the parent company, 150 East Broad Street.

General manager of the Highland Stone Division in charge of operations will be Paul E. Ryan, who also is in charge of the company's Plum Run Stone and Basic Construction Materials Divisions. Sales manager is Leo L. Davis, who also is in charge of sales for the Plum Run Stone Division.

New York Coal Sales also owns and operates the following Ohio concerns: the Hocking Valley Brick Company at Logan and Nelsonville; the New York Coal Company at Chauncey; Basic Lumber Products Company, McArthur; the Southern Orchards Division, Jackson; Southern Quarries and Contracting Division, Chillicothe; Superior Cement Division, Portsmouth; Plum Run Stone Division and Basic Construction Materials Division, Chillicothe and Circleville.

Research Reveals New Uses For Oregon Volcanic Glass

A new use for Oregon volcanic glass has been developed by the State Department of Geology and Mineral Industries. The volcanic glass, when used as a feldspar substitute in a ceramic glaze, produces a glaze suitable for stoneware, artware, and terra-cotta products. Finely ground pumice, volcanic ash, and perlite, forms a volcanic glass found mainly in the central and eastern parts of the state, can be used to replace more costly material shipped into the area from considerable distances.

The glaze was perfected after nearly two years of research by C. W. F. Jacobs, department ceramist, who experimented with numerous nonmetallic products found in Oregon. Results and test data have been published in a short paper entitled *Glazes from Oregon Volcanic Glass*, and may be purchased from the Portland office, 702 Woodlark Building, or in the field offices in Baker and Grants Pass. Price (postpaid), 20 cents.

• Christmas Seal funds have fought tuberculosis since 1907; yet tuberculosis still kills more people than all other infectious diseases. Pit and Quarry urges its readers to contribute this year, so that the fight may be continued, and "Peace on earth, good health to children" may become a reality.

Lawrence's New Kiln To Increase Capacity 50 Percent at Thomaston

A program designed to increase its production of portland cement and to help remedy the scarcity of this basic commodity in the territory it serves is being undertaken by the Lawrence Portland Cement Company at its Thomaston, Me., mill.

The company announces that the smaller of the two rotary kilns now in operation will be replaced by a new and larger kiln which it is expected will increase the mill's present annual capacity of portland cement by approximately 50 percent. The dimensions of the new kiln will be 11 ft. in diameter by 356 ft. long, the exact size of the kiln to be retained. Some idea of the length of this equipment may be had by realizing that a fly ball hit 356 ft. would be a home run in many major league baseball parks. The kiln will weigh approximately 1,250,000 lbs.

Installation of this new equipment will proceed as rapidly as the material and accessories for it are received. Much of the machinery has to be specially designed and manufactured, however; and it is estimated that some seven or eight months will elapse before it can all be assembled, tested, and placed in full operation. Officials state that inasmuch as the smaller of the present kilns must be removed to make room for the new one, production next spring will fall below current levels for two months or more while the change is being effected. Once the new kiln is in operation, however, they believe that this loss will rapidly be made up.

The kiln installation at Thomaston also calls for kiln and feeder motors; a kiln hood, damper, fan and kiln drive; 10,000 lbs. of steel and nearly 24,000 ft. of reinforcing bars; a clinker cooler and breaker; a starter, a rheostat and a gear reduction unit.

Also included in the company's plans, it is announced, are six new Buell cyclone dust collectors to absorb the additional dust which the increased kiln capacity will create.

Marquette G.I. Families To Get Free Hospitalization

In August of this year the Marquette Cement Manufacturing Company set up a plan which gives hospital protection to dependents of employees who are drafted or who enlist in the armed forces of the United States.

Under the new policy any Marquette employee who is carrying dependent insurance at the time of his induction will automatically continue to hold such coverage without charge. Marquette will pay the entire cost of this protection. The free dependent insurance will be in effect for three years, the normal enlistment period. If the national military situation requires service of more than three years, the policy will be reviewed. The arrangement will be cancelled when the employee returns to work after his honorable discharge, when he may resume it on the regular contributory basis.

New Lone Star Plant Expected to Produce 5 to 6,000,000 Bags Yearly

Construction has started on the new plant of the Lone Star Cement Corporation near Sweetwater, in the heart of the rapidly developing west Texas area. The plant is situated near Maryneal on the Santa Fe Lines. With an annual productive capacity of between 5,000,000 and 6,000,000 sacks of Lone Star cements, this new mill, the third Lone Star plant in Texas, is expected to be one of the most modern in the world.

With materials and machinery already on order, construction schedules call for completion sometime during 1951. All of the work will be done by Walsh Construction Company and Gifford-Hill & Co., Inc., who are associated as general contractors.

Adjacent to the mill, where the limestone quarries are located, a large crushing plant will be constructed. The huge crusher will take the largest pieces of limestone rock that can be handled by electric shovels with 3-cu. yd. dippers and reduce them to 6- to 8-in. size. The rock will then go into secondary crushers for further reduction so that all of it will pass through a ½-in. opening. The quarry and crushing plant will have a capacity of about 500 t.p.h. The crushed material will be conveyed to a storage building on the plant site.

The storage building and adjoining mill building will be constructed entirely of concrete, the roof will consist of an arch with a 77-ft. span between the walls and no intermediate supports.

In the storage building there will be two overhead cranes traveling the full length of the storage, so arranged that material of various kinds can be mixed and delivered into bins which feed the mills.

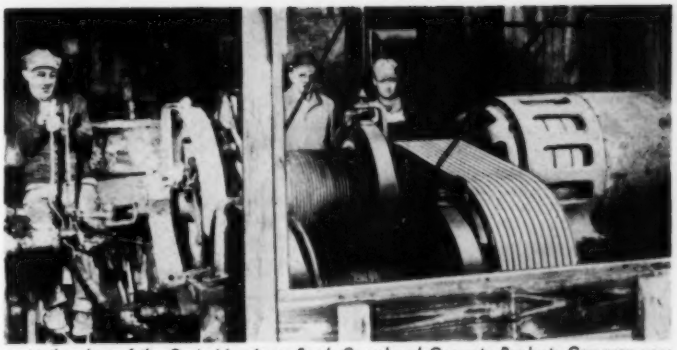
The mill building will house five large ball and tube mills, two driven by 500-hp. motors and the others by 800-hp. motors. The raw mix will be transported by pneumatic conveyors to the raw mix silos, consisting of eight units each 22 ft. in diameter by 80 ft. high.

There will be two kilns 10 ft. in diameter by 340 ft. long. Natural gas will be supplied by the Lone Star Gas Company. Each of these kilns will produce about 2,000 barrels of clinker every 24 hours.

There will be 15 storage silos, each 26 ft. in diameter by 120 ft. high. Each of these silos will hold about 13,000 bbls. of cement. In the packhouse, four packing machines will each have a capacity of 300 bbls. per hour. The entire shipping department will be arranged so that the maximum amount of cement to be shipped on any single day can readily be handled.

The silos, both for the raw mix and cement storage, are being constructed by the Macdonald Engineering Company of Chicago.

The operation of this plant will require about 6,000 horsepower. Electrical energy will be supplied by the Texas Electric Service Company. All drives throughout the plant will be electric motors.



● At the plant of the G. A. Monninger Sand, Gravel and Concrete Products Company near Terre Haute, Ind., which handles at least 300 cu. yds. of gravel daily, a Gates Rubber Company Vulco rope drive has licked the maintenance problem, according to Art Day, plant superintendent. Repairs on the old gear-driven winch were costing the firm more than $300 a year —an expense which has been eliminated by the V-belt drive. Ropes of new setup are said to require neither lubrication nor belt dressing and are not affected by sand and grit.

For the maintenance of the plant a machine shop will be erected, fully equipped for all repair work. A storeroom for the necessary supplies and repair parts will also be built. In this building will be rooms for employees, equipped with lockers, showers, and toilet facilities, a large hall for conferences, safety meetings, etc., as well as others which will serve as recreation and lunch rooms for employees.

The plant management office and laboratory will be housed in a one-story building of modern design. This building will be air-conditioned and will have the most efficient equipment for the control of the production process.

Bureau of Mines Approves Respirators in New Bulletin

Respiratory protective devices approved by the Bureau of Mines to June 1, 1950, are listed in a publication released by the Department of the Interior.

To assure the availability of safe, satisfactory, and reliable respiratory devices for use in mining and allied industries, the Bureau has established schedules of minimum requirements in five categories.

The publication giving the latest list of approved devices also includes photographs showing the various categories. A free copy of Information Circular 7570, *List of Respiratory Protective Devices Approved by the Bureau of Mines*, by S. J. Pearce, Bureau chemist, and L. B. Berger, acting chief of the Bureau's health branch, may be obtained from the Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh 13, Pa.

Hal Drimilla and Bob Siel Summoned to Army Service

During the last few weeks two members of PIT AND QUARRY's staff left our office to answer Uncle Sam's beckoning finger. Harold R. Drimilla, field research editor since January, 1948, and a member of the Reserves after serving with the U.S. Army during World War II, is now 1st Lt. H. R. Drimilla. Hal enlisted in the Signal Corps on September 14, 1942. He served in the Aleutian Islands and in the N.E. sector, which included the Azores, Bermuda, Iceland, Newfoundland, Labrador and Greenland.

Robert J. Siel, assistant circulation manager for PIT AND QUARRY and affiliated publications since May, 1948, saw service with the Signal Corps during World War II in Germany and France, specializing in P.B.X. switchboard and telephone communication. He also joined the Reserves after the cessation of hostilities in 1945.

Hal's efficiency in compiling the PIT AND QUARRY HANDBOOK, assembling market surveys, and conducting field research work—all important phases of his work at PIT AND QUARRY—was valued as a contribution to the progressive improvement of all our publications. Particularly outstanding was his handling of color layouts in feature stories, his own as well as those of other writers.

We wish these two members of the armed forces success in their careers and trust that they will return in the not-too-distant future to their families and civilian peacetime pursuits with PIT AND QUARRY.

Fire Clay Production in 1949 Decreases from '48 Total

Fire clay sold or used by producers in the United States in 1949 decreased 13 percent to 8,571,844 tons, according to reports to the U.S. Bureau of Mines. This decrease was due in part to a general decline in industrial demand for refractories and in part to work stoppages in the coal and steel industries. Of the 17 principal fire-clay producing states, 7 (Arkansas, Colorado, Indiana, Maryland, Tennessee, Utah, and Washington) reported increases; the remaining 10 reported decreases.

The two major uses of fire clay are in refractories (4,811,099 tons in 1949) and heavy clay products (3,430,723 tons) —96 percent of the total tonnage.

The sales value of fire clay, ($2.91 average in 1949), varies considerably according to the location of the deposit, and the type and quality of the clay.

Safety Trophies, Awards Announced in '49 Contest Of Sand-and-Gravel Plants

The Van Sciver plant of the Warner Company at Tullytown, Pa., the Talton plant of the Texas Construction Material Company at Alleyton, Tex., and the Thomas plant of the Fort Worth Sand and Gravel Company, Incorporated at Birdville, Tex., won top safety honors in the twenty-first National Sand and Gravel Association Safety Competition conducted by the U.S. Bureau of Mines. These operations were awarded the trophies provided by *Rock Products* for having achieved the best safety records in the three groups of sand-and-gravel plants in the competition. In addition to the trophy awards, 22 sand-and-gravel operations have been awarded Certificates of Achievement in Safety by the Bureau of Mines for having been worked throughout 1949 for 20,000 or more man-hours without any disabling injuries.

The Van Sciver plant, a dredge operation of The Warner Company, had the best safety record in the group working 100,001 or more man-hours. It was injury-free during a total operation of 433,245 man-hours during 1949. The trophy award for its safety achievement in 1949 is the seventh such award to the plant.

Top safety honors in the group working 50,001-100,000 man-hours were awarded to the Talton plant of the Texas Construction Material Company for its injury-free record during a total worktime of 93,720 man-hours during 1949.

In the group working 50,000 or less man-hours the Thomas plant of the Fort Worth Sand and Gravel Company, Incorporated, won the trophy for working a total of 43,928 man-hours without any lost-time injuries during 1949.

Employees and officials at 44 of the 109 competing sand-and-gravel operations in the 1949 contest achieved the outstanding safety records of operating throughout the year without any lost-time injuries, according to the Bureau of Mines. Men at these plants, of which three were trophy winners, worked 1,884,158 man-hours or 26 percent of the 7,146,110 man-hours worked in all the enrolled plants.

The following plants (excluding the trophy winners) arranged in order of hours of exposure were worked through 1949 without any disabling injuries. The first 22 were awarded Certificates of Achievement in Safety:

Dolen wet-pit plant, Texas Construction Material Company, Romayor, Tex., 108,310 man-hours.

South Side river plant, Dravo Corporation, Keystone Division, Pittsburgh, Pa., 106,889 man-hours.

Roscoe No. 2 dry-pit plant, Consolidated Rock Products Company, Roscoe, Calif., 102,651 man-hours.

Sunland dry-bank and dry-and-wet-pit plant, City Rock Company, Sunland, Calif., 88,093 man-hours.

Hudson dry-and-wet-pits plant, Gifford-Hill and Company, Incorporated, Hearne, Tex., 76,919 man-hours.

Eddyville wet-pit plant, Concrete Materials Company, Eddyville, Ia., 70,098 man-hours.

Milwaukie dry-bank plant, Portland Road and Driveway Company and T. P. Sand and Gravel Company, Milwaukie, Ore., 63,217 man-hours.

Amarillo dry-pit plant, Panhandle Gravel Company, Amarillo, Tex., 50,372.

Boonville No. 1 dry-bank plant, Eastern Rock Products, Incorporated, Boonville, N. Y., 42,625 man-hours.

Steilacoom dry-bank plant, Glacier Sand and Gravel Company, Steilacoom, Wash., 38,833 man-hours.

Rockfield No. 124 wet-pit and river plant, Pacific Coast Aggregates, Incorporated, Friant, Calif., 37,566 man-hours.

Kaw No. 2 river plant, Stewart Sand and Material Company, Turner, Kan., 34,090 man-hours.

Venango dry-bank plant, Industrial Silica Corporation, Utica, Pa., 32,460 man-hours.

Claremont No. 11 dry-pit plant, Consolidated Rock Products Company, Claremont, Calif., 32,008 man-hours.

Corrigan dry-pit plant, Texas Construction Material Company, Corrigan, Tex., 28,780 man-hours.

Sierra No. 19 dry-pit plant, Consolidated Rock Products Company, Monrovia, Calif., 26,902 man-hours.

Olympia No. 125 dry-bank plant, Pacific Coast Aggregates, Incorporated, Felton, Calif., 26,424 man-hours.

Winona wet-pit and lake plant, Winona Sand and Gravel Company, Winona, Minn., 24,500 man-hours.

South Bend dry-bank plant, South Bend Sand and Gravel Corporation, South Bend, Ind., 23,884 man-hours.

Yardley wet-pit plant, Union Sand and Gravel Company, Spokane, Wash., 22,749 man-hours.

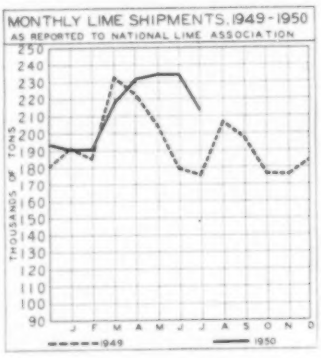
Starbrick river plant, General Concrete Products Corporation, Starbrick, Pa., 22,084 man-hours.

Barneveld No. 2 dry-pit plant, Eastern Rock Products, Incorporated, Barneveld, N. Y., 20,502 man-hours.

The over-all safety record of the 109 sand-and-gravel operations in the 1949 competition was not favorable when compared with the 1948 injury experience. The injury severity rate of 5.16 days lost per 1,000 man-hours of work was sharply higher than the corresponding rate of the 1948 contest. It also was higher than the average severity rate of 4.61 for the 21 years of the contest. However, the injury frequency was improved over 1948 and the 1949 rate of 26.87 injuries per million man-hours was the seventh lowest annual frequency rate in the history of the competition.

A total of 7,146,110 man-hours were worked at the 109 operations enrolled in the 1949 competition. During this work-time there were 192 injuries or 20 more than in 1948, when competing plants were operated 5,857,039 man-hours. Five of the injuries in 1949 were fatalities, five were permanent partial disabilities, and 182 were temporary total injuries. The average disability of the temporary total injuries was 26 days, an increase of 6 days from the corresponding figure of 20 days in 1948.

Of the 192 disabilities at competing plants in 1949, causes stated on reports for 191. Falls of persons caused 38 injuries or 20 percent of the total. The next most prominent causes of injuries were machinery and falling objects, each of which resulted in 22 injuries or 12 percent of the total. Hand tools caused 20 injuries, haulage 19, and handling objects 18 or respectively 11, 10, and 9 percent of the total. Injuries from slides of material had an average of 1,442 days lost per injury, a higher average severity than from any other listed cause. Haulage accidents with an average severity of 654 days per injury had the next most severe injuries.



According to data collected by the National Lime Association, 47 companies in July, 1950, shipped 212,927 tons of lime (133,495 quicklime; 79,432 hydrate). Reporting companies represent 60.5 percent of the association members' total capacity of record. Based on Pit and Quarry's estimate for the remainder of the industry, the total shipments were approximately 387,000 tons. Shipments by uses and grades for July, 1950, were:

	Quicklime	Hydrate
Agricultural	1,305	9,322
Building	16,390	41,798
Chemical	115,800	28,312
Totals	133,495	79,432

Prizes to Lehigh Workers Who Take Pride in Their Jobs

In a contest sponsored by the Lehigh Portland Cement Company on the theme "Pride in Your Job", in which all employees paid on an hourly basis were eligible, the company awarded a $25 U.S. Saving Bond to the winner in each plant and first and second prizes—a $100 bond and a $50 bond, respectively—to top papers in the national competition.

Winner of the top prize was Francis P. Foose of the Buffalo, N.Y., plant, while Peter Ryser of the Ormrod, Pa., plant took the second national prize. Among the winning essays in plant groups was that of Charles Vineyard at Iola, Kan. Mr. Vineyard was awarded a $25 bond at a banquet given by the company, with Plant Manager R. E. Jones presiding.

$2,800,000,000 Expended For September Building Dept. of Labor Reports

According to a report issued by the U.S. Department of Labor's Bureau of Labor Statistics and the Construction Division, U.S. Department of Commerce, increased industrial building was the outstanding feature of construction activity in September. The total value of new construction put in place during September amounted to nearly $2,800-,000,000, 1 percent above the August total and 26 percent more than in September a year ago. Private residential building activity showed a further small expansion, and highway construction advanced contra-seasonally.

Industrial building valued at an estimated $101,000,000 was done in September, the highest monthly total since early in 1949, and a jump of 46 percent over the September, 1949, level. The large volume of contracts let for industrial buildings in recent months foreshadows increased activity in this field for several months to come.

Warehouse and office building construction activity also increased in September. Most other types of nonresidential building began to level off seasonally.

During the first 9 months of 1950, new construction with a total value of more than $20,000,000,000 was put in place. Private outlays for new construction amounted to $15,000,000,000, 27 percent more than during the corresponding period of 1949, and public new construction expenditures totaling $5,-000,000,000 were 8 percent above last year. The private homebuilding boom was responsible for most of the increase over last year in total private investment in new construction. New schools, highways, and conservation work accounted for the bulk of the increase in public construction expenditures.

Government Bureau Offers To Lease Phosphate Lands

More than 2,400 acres of phosphate lands in the Kemmerer area of Wyoming will be leased by the Federal Land Management Bureau in the immediate future.

The deposits, located about 12 miles northwest of Kemmerer and six miles northeast of the old community of Sublet, will be leased to the highest bidder. A minimum bid of $1 per acre has been set, and the minimum investment will be $60.

It is also required that the successful bidder must maintain a minimum annual production of 24,000 tons, beginning with the fourth lease year.

The Southwest Potash Company, a subsidiary of American Metals, has chosen shaft sites for the fifth potash operation in the Carlsbad district. Core drilling for underground conditions will continue until location of deposits, water, and quicksand have been definitely determined.

• R. N. McDowell (left), president of Gary Slag Corp., and J. E. Campbell, superintendent of the plant at Granite City, Ill., at Gary Slag's booth.

Gary Slag Corp. Exhibits Products at Railroad Meeting

A crushed slag exhibit at a railroad men's convention—? R. Newton McDowell, president of the Gary Slag Corporation, thought it perfectly logical, in view of the fact that his company alone sold over 800,000 tons of crushed slag last year to midwestern railroads for use as roadbed and station ballast. Mr. McDowell even went so far as to predict that in the future, a very large portion of the crushed slag produced would be bought up by railroads for these applications.

Many of the major railroads in the Midwest have been turning to the use of crushed slag for ballast, according to Mr. McDowell, due to its excellent water resistant qualities. The slag ballast used is from ⅜ to 1½ in. in size. An interesting sidelight is that the fines from the crushing process (minus ⅜-in.), have found application as a roadbed base, and more widely as station platform ballast. The fines take on a hydraulic set when subjected to wet weather, forming a concrete-like mass.

Mr. McDowell cited one method of application of this material that is now being used by the Burlington Railroad on a 70-mile stretch of track under construction. First a base of the slag fines 6 in. deep is put down, over which the regular ⅜- to 1½-in. slag ballast is laid. This base of slag fines is expected to provide a good water seal for the roadbed, thereby increasing its resistance to washouts.

The crushed slag exhibit was at the biennial exhibition of the Track Supply Association and the Bridge and Building Supply Men's Association held recently at the Coliseum in Chicago. The Gary Slag Corporation, Gary, Ind., which sponsored the exhibit, is an affiliate of the Granite City Slag Company, Granite City, Ill., and the McDowell Stone Company, Blackwater, Mo. R. Newton McDowell is president of all three, J. Edward Campbell is superintendent of the Granite City plant, and P. J. Mack is superintendent at Gary.

18-Point Program Planned For Plant Maintenance Meet

An 18-point program of plant maintenance techniques has been set for discussion at the Plant Maintenance Conference to be held in Cleveland in January, it was announced by Clapp and Poliak, Inc., exposition management. The conference will take place during the first three days of the Plant Maintenance Show, January 15-18, inclusive, at the Public Auditorium in Cleveland.

Four general sessions will be held for all visitors and eight sectional conferences for executives and engineers with specialized problems. L. C. Morrow, consulting editor, *Factory Management and Maintenance*, will serve as general chairman of the conference.

Advance registration cards and hotel information may be obtained from Clapp and Poliak, Inc., 341 Madison Avenue, New York 17, N. Y.

1949 Barite, Barium Output Third Highest on Record

Domestic mine production of 731,308 short tons of primary barite during 1949 was the third greatest annual output on record, being surpassed only in 1947 and 1948, according to reports by producers to the U.S. Bureau of Mines. Arkansas, the leading state, produced almost half of the United States total and nearly twice as much as the second leading state, Missouri. Georgia and Tennessee production continued to decrease. New production was reported from New Mexico and South Carolina.

Total barite consumed in the United States during 1949 (719,542 short tons) was the lowest in several years.

Cement Firms' Records Reveal Mounting Profits During Current Year

A profitable year appears to be indicated for several leading cement firms, which report additional dividends to match mounting figures in their "earnings" columns. Lone Star Cement Corporation officials ordered an extra of $1 and a regular quarterly dividend of 87½ cents on common stock, both payable September 26 to stock of record September 11. Lawrence Portland Cement Company declared a special of 25 cents and a regular quarterly dividend of 25 cents on common, both payable September 15 to stock of record September 1.

An extra dividend was also revealed to have been paid by the Halliburton Oil Well Cementing Company—75 cents on common stock, payable September 20 to share holders of record September 5. A regular quarterly dividend of 50 cents was also declared, payable December 20 to stockholders of record December 5. The 1950 total will be brought to $2.50, as against a total dividend payment of $2 for 1949. Net profits for Halliburton's January-June period this year stood at $4,223,199, as compared with $3,371,562 for the first six months of 1949.

The General Portland Cement Company's six-month total profit stood at $3,180,200, a considerable improvement over the 1949 six-month figure—$2,547,800. Alpha Portland Cement Company's net income for the year ended June 30 was the only case reported in which the 1949-1950 figure ($3,128,552) fell below that of 1948-1949 ($3,348,817).

A $2,793,564 net profit total for the first six months of 1950 was reported by the Lehigh Portland Cement Company, which earned $2,386,564 during the comparable period in 1949.

Fewer Workers, Sharp Rise Seen in Mining Safety Index

Employment in the mineral industries declined 3 percent in 1949 to an average of 717,600 men working daily. Mineral plants were active an average of 207 days, 42 less than in 1948. Owing to the smaller labor force and to the smaller number of days of operation, the total man-hours worked in 1949 declined 20 percent from 1948.

The injury record of the mineral industries was improved sharply in 1949. A total of 772 fatal injuries, 455 less than in 1948, occurred at a frequency of 0.66 per 1,000,000 man-hours of exposure. This represented a 21-percent improvement over the corresponding rate in 1948, and was the best frequency rate for any year since complete injury data became available in 1930. An estimated total of 53,345 non-fatal injuries occurred in the extractive industries at a frequency rate of 45.50 per 1,000,000 man-hours during 1949. This was a reduction of 25 percent in number of injuries and 7 percent in the frequency of occurrence of nonfatal injuries from corresponding 1948 data. The rate of occurrence of nonfatal injuries in 1949 was lower than that of any year for which injury statistics are available.

There was no major disaster (a single accident in which 5 or more men are killed) in the mineral industries during 1949. This is the first calendar year in which there were no major disasters since complete fatality statistics on the mineral industries were first available in 1910.

Harbison-Walker Publishes Revised Refractories Manual

The Harbison-Walker Refractories Company recently announced publication of the third edition of *Modern Refractory Practice*, described as a practical engineering handbook, a comprehensive technical treatise, and a catalog of that company's products. This volume, while following the general lines of the second edition, published in 1937, has been completely rewritten to cover the latest developments in industrial refractories and their applications.

Scale drawings of 20 types of furnaces illustrate not only the detailed design features, but also the types of refractories generally used in general and special conditions of operation.

Modern Refractory Practice is offered without charge to users of refractories, to libraries, and to heads of departments in universities and technical schools. For general distribution, a nominal charge is made.

Team of Experts Produces Volume on Plant Engineering

A total of 87 authorities from five universities and 45 of the nation's industrial organizations have collaborated to bring together under one cover in the *Plant Engineering Handbook* the essentials of good practice in economic, mechanical, chemical, and power phases of modern industry.

The book was edited by William Staniar, former mechanical power engineer for E. I. du Pont de Nemours & Company. The price is $15. Published by the McGraw-Hill Book Company, Inc.

Game Score Zero in Hunt, But Hunter Brings Down Big Quarry—of Kieselguhr

Hunting deer along Antler Ridge in the upper Sevier River valley may not have been profitable for the hunter, Gale Wilcock of Hatch, Utah, but he made a discovery recently which led to what may be a large-scale industry in that area. In his pursuit of the deer Mr. Wilcock found outcroppings of a deposit of diatomaceous earth known as kieselguhr, a white siliceous material used in many modern industries.

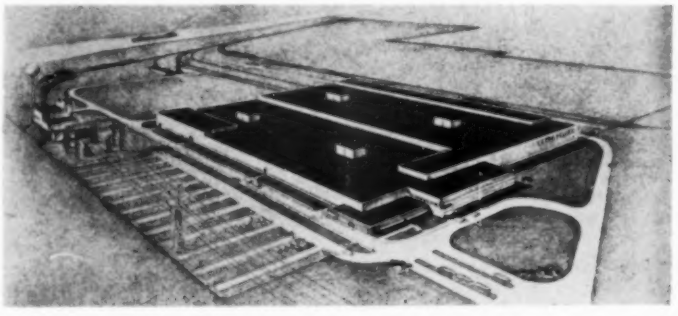
With Sam Evans as a partner Mr. Wilcock staked out a claim, an action which was followed by eight other local residents, who together with the original "prospectors" form the Antler Mine. Each partner, however, holds his own stake, identified by its special title.

Mica Research Results Told At Colorado School of Mines

Details of a four-year mica research project at the Colorado School of Mines, until recently withheld from the public, have been released with an announcement that mica has been synthetically produced at Golden, Colo., in large quantities. The announcement was made by Dr. William C. Aitkenhead, director.

According to Dr. Aitkenhead, cakes of mica weighing up to 500 lbs. have been formed by a new "cool hearth" method, which avoids the use of crucibles. He stated that although large cakes were made, there were disappointingly few large individual crystals. This work, under a Signal Corps grant, will not be continued, as the government has failed to provide funds for additional research.

The Ideal Cement Company's plant at Portland, Colo., has been given an honor award by the Portland Cement Association for its record of safe operation during 1949. The Ideal mill was one of four plants in the United States and Canada to become a first-time winner. The plant was operated during the entire year without a single lost-time accident.



• The accompanying illustration shows an artist's conception of the Caterpillar Tractor Company's new plant at Joliet, Ill., at which bulldozers, scrapers, wagons, and rippers will be manufactured, in addition to cable and hydraulic controls for this equipment. The site, about 300 acres in size, is between U. S. Highway 6 and the Des Plaines River, approximately 2 miles southwest of Joliet.

From the State Capitals

CALIFORNIA—A $101,664,500 budget for highway construction and purchase of rights of way during the 1951-52 fiscal year was recently approved by the California State Highway Commission.

Charles H. Purcell, state director of public works and chairman of the Highway Commission, explained that the total figure includes $78,808,500 for actual construction and highway improvements and $22,856,000 for right-of-way purchase for projects contemplated in subsequent years.

The 1951-52 total budget compares with $88,826,000 budgeted for construction and rights of way during the current fiscal year. However, last July the current figure was increased by nearly $20,000,000 by the commission due to savings from bids lower than budgeted amounts. Sixty-six of the state's 58 counties will get major highway improvements under the new budget.

COLORADO—Ground-breaking ceremonies for the Denver-Boulder toll highway were conducted on October 16 at the Boulder terminus of the turnpike. Final agreement on details for a $6,300,000 bond issue for financing the project were reached at a conference on October 5. Boettcher & Company, a Denver investment firm, is handling the bond transactions.

The state obligation or guarantee for the undertaking is limited by law to 30 percent of $5,300,000, the amount stipulated in the toll road act passed by the state legislature. The total estimated guarantee for the toll road, including interest, is placed at $2,600,000. However, if the project is self-liquidating, this sum will be absorbed.

ILLINOIS—Constitutionality of a 1949 state law empowering cities to build and operate off-street automobile parking facilities in order to relieve mid-city traffic congestion has been upheld by the Illinois Supreme Court.

The law allows cities to finance development and operation of parking lots by revenue bonds, paid off from the income the lots produce. It permits a city to run its own parking facility or to lease it to private operators. Cities are empowered by the statute to condemn property for parking purposes.

NORTH CAROLINA—The proposal for construction of a north-south toll turnpike through the industrial Piedmont area of North Carolina has been dropped for the present. Governor W. Kerr Scott explained that an income of $16,000 per mile would be necessary to make the project pay, but surveys indicated the revenue probably would amount to only $8,500 per mile. Advocates of the toll highway want to keep the idea open pending decisions by West Virginia and Virginia on toll superhighways linking the South with the Midwest.

MICHIGAN—A committee representing the state of Michigan, the county of Wayne, and the city of Detroit, has agreed on plans for the issuance of $100,000 in revenue bonds to finance the completion of the Edsel B. Ford and John C. Lodge expressways, serving the city of Detroit and Wayne County.

It was announced that sale of the bonds would begin within the next six months upon the completion of construction plans. It was also agreed that the bond issue will cover a 25-year period, and that the state will be the selling agent.

Michigan's legislature this year passed a special act authorizing such bonds. They will be retired from gasoline and weight tax revenues which the county and city receive annually from the state. It is also expected that federal aid will be available. The method of financing being planned is designed to make completion of the two projects possible within 4 instead of 14 years.

VIRGINIA—Virginia's State Department of Education has announced its approval of school building programs amounting to $157,000,050 for 69 of the state's 127 localities. If the state's remaining cities and counties submit programs calling for similar amounts, Virginia will have a school construction program involving projects worth more than $300,000,000 under way during the next four years. This total is exclusive of funds that may be spent for land sites and equipment.

The Virginia total already approved includes $25,865,578 of the $45,000,000 made available by the 1950 state legislature for state aid to localities for school construction.

FOUR-STATE WATER SUPPLY—A program designed to provide a self-supporting means of solving most of the water supply problems of Delaware, New Jersey, New York, and Pennsylvania through the year 2000 will be submitted to the legislature of those states by the Interstate Commission on the Delaware River Basin.

In deciding on this course at its 14th annual meeting, the Commission accepted in principle engineering recommendations for a system of dams, reservoirs, transmission pipelines, and tunnels.

Proposed to serve an area populated by 20,000,000 persons, the program would contain a river-regulation feature providing for storage of spring flood waters for use during dry months. It is also anticipated that a substantial volume of hydro-electric power could be released at the contemplated dam sites.

Recommendations to the four legislatures will include a request for immediate establishment of a four-state commission or authority to plan, finance, construct, and operate the program.

The program would be carried out in two stages, with the construction cost of the first period estimated at about $550,000,000, and the second at $250,000,000. First stage of the project would require 12 years for completion.

Under the plan, the states would pay for the construction and operation of the program in proportion to benefits received. Through the sale of water to municipalities and the operation of hydro-electric facilities by private utilities it is estimated the project would be self-liquidating in about 50 years.

Growing Suburban Traffic "Floods" American Streets

Census figures showing that nearly three-quarters of the new residents in the nation's 12 largest metropolitan areas live in the suburbs were cited recently as evidence "that near breaking-point conditions prevail in our city streets".

Lt. Gen. Eugene Reybold, executive vice-president of the American Road Builders' Association, pointed out that "floods" of motor vehicles inundate major traffic arteries of these cities each day to take workers from their homes to work and back. Much of the transportation, he declared, must make use of roads and streets patently not made ready for such hard punishment. General Reybold urged that city officials must undertake "flood control" in metropolitan areas, however expensive, in order to eliminate congested streams of motor vehicles and broken-down pavements.

Prices Sharply Advanced By Freeport Sulphur Company

Price advances bringing the cost of domestic shipments of sulphur to $22 a ton, a $4 rise, and sulphur for export to $25 a ton, a $3 hike, were made recently by the Freeport Sulphur Company. The firm's officials stated that its shipments have been running in excess of production, and urged customers to conserve supplies.

Texas Gulf Sulphur Company is expected to take similar steps when present contracts expire at the end of the year. It is understood, states the *Wall Street Journal*, that Texas Gulf "will pare its deliveries by 20 percent over the remainder of the year to check the decline in its inventories of sulphur above ground".

Virginia Perlite to Build Expansion Plant at Hopewell

The Virginia Perlite Company has announced the completion of arrangements for the installation of a perlite ore expanding plant in Hopewell, Va. H. W. Van Ness, president, stated that the new plant will have an exclusive license arrangement with the Great Lakes Carbon Corporation, New York, to sell their processed perlite under the registered trade name "Permalite."

The new expanding plant of the Virginia Perlite Company is expected to meet the demand for perlite within a radius of 150 miles of the plant. Capacity will be about 20,000 bags per month.

New Industry Is Launched In Arizona's City Upstairs

In the mile-high city of Prescott, Ariz., a new industry has been launched by the Jost Construction Company, which is completing a concrete block plant. Products will include both cinder and concrete units.

Harlan Jost is in charge of operations. Assisting him are Charles Bong, foreman, and his son, Kenneth Bong, and Bob Gochnour.

30 years ago in Pit and Quarry

By WALTER E. TRAUFFER

AN article in the November, 1920, issue of PIT AND QUARRY described the progress made by this publication in its then brief history. A photograph of four sets of bound volumes, one for each year of its existence, clearly showed the physical growth of this journal. Its growth in prestige and value to the nonmetallic minerals industries was described. When PIT AND QUARRY first appeared, there were apparently some misgivings as to whether or not this field could or would support such a journal, but it soon became apparent that it would. Producers welcomed it as a medium through which they could find adequate expression and from which they could get much-needed information. Manufacturers welcomed it as a direct advertising medium, and it was stated that many were encouraged by its existence to develop machinery for this field.

Probably the most important article in that issue was a staff-written outline of what should be done by producers to prepare their plants for winter operation or for winter shutdowns. Advice was also given on making minor and major expansions during this period.

Another article of importance to many readers was a complete discussion on storage systems for agricultural limestone and other pulverized materials by J. R. Bent of Illinois Agricultural Association. Many types of shed, bin, and silo storage were described and illustrated.

Association affairs in this issue included a complete report of a meeting of the National Agricultural Lime Association at Indianapolis on October 15. The chief subject of discussion was the proposed law governing uniform agricultural lime, including all liming materials. There was also an announcement of the addition of two new members to the association's staff. Laurance Hart, chemical engineer, was the new head of the construction department, and Major E. Holmes, Ph. D., was made manager of the chemistry department.

Talc mining and milling methods practiced by three companies in the vicinity of Madoc, Ontario, were described in an article by Raymond B. Ladoo, then Mineral Technologist, U. S. Bureau of Mines. Mr. Ladoo later held important positions in the nonmetallic minerals industries and is now one of the leading authorities in this field.

A staff article in this issue described two new sand and gravel plants in Michigan, the Cass City Sand & Gravel Co., and the Tuscola Sand & Gravel Co., both at Cass City. Both used dragline cableway excavators.

An interesting comparison of wagon vs. truck haulage was presented in an article on the operations of Gottron Bros., Fremont, O. Six horses and 18 men were required to load 15 to 18 tons of rock per hour and haul it a distance of 200 yards from the quarry to the primary crusher. With a steam shovel, one truck and a belt conveyor six men delivered 40 tons per hour to the crusher.

What must certainly have been one of the first uses of air freight delivery in this field was described in this issue. A large company in the Chicago area had a breakdown of the crane feeding its plant and was faced with a long shutdown. The manufacturer of the crane, 135 miles away, was reached by telephone, and a few hours later two aeroplanes delivered the parts to a truck at an airport near the plant.

Nonmetals Concerns Show Steady Sales, Income Rise

Nonmetallic minerals operations showed sales and earnings well above the figures for comparable periods last year. The United States Gypsum Company's January-June net sales this year totaled $79,421,162; last year they stood at $64,534,819. Net income for the first half of 1950 was $14,774,739, as compared with $10,326,102 for that period in 1949. The company declared an extra of $1 and a regular quarterly dividend of $1 on the common, payable October 2 to stock of record September 8. A like extra dividend was paid on July 1. (The quarterly rate was raised from 75 cents to $1 in July, 1949.)

A sustained high level of building activity, a larger volume of industrial business, and a drop in production costs reportedly resulted in an increase in the net earnings of the New England Lime Company, which in the six months ended June 30 showed $1.27 per share, as compared with 83 cents in the like period of 1949. Sales and other income during the January-June period rose from $700,000 (1949) to $874,000 (1950).

An extra of 35 cents and two quarterly dividends of 35 cents each were declared by the United States Potash Company on common shares. The first regular dividend was payable September 1; the other quarterly dividend and the extra are both payable December 15 to holders of record December 1. According to H. M. Albright, president of the firm, the current operations of U. S. Potash are at the highest rate in the company's history, despite a strike which had an adverse effect upon business during the first two months of the year.

Louis Ware, president of the International Minerals and Chemical Corporation, reported that his firm set new record highs in sales and earnings in the fiscal year ended June 30. Net sales increased 9 percent to $58,402,180 from $53,394,760 in the preceding year, while net earnings rose from $5,421,017 to $5,776,660. The dividend on the common stock was increased from 70 to 80 cents a share.

Operations of the Minnesota Mining & Manufacturing Company during the first six months of 1950 were at high levels, with a 20 percent increase in sales and a 53 percent increase in earnings. R. P. Carlton, president, stated that future operations are certain to feel the effects of important and necessary changes to meet the needs of the military, but that the company is prepared to meet them and to make progress in the months ahead. Net sales for the six months ended June 30 were $65,577,460; net income, $9,682,389. For the like period in 1949 sales were $54,552,850; income, $6,330,227.

Marquette's Yearly Report Takes 1st Prize Sixth Time

For the sixth consecutive year, the Marquette Cement Manufacturing Company has won top honors for excellence in annual reporting. The independent board of judges in the Financial World Annual Report Survey announced its finding that the Marquette 1949 Annual Report takes first place in the cement industry. The bronze "Oscar of Industry" trophy, emblematic of the honor, will be presented to W. A. Wecker, president of Marquette, at the Annual Awards Banquet in the Grand Ballroom of the Hotel Statler in New York on October 30, 1950.

More than 5,000 corporate reports were submitted in this national survey, the tenth in the series. These were judged in 100 industrial classifications for "Best of Industry" awards. In the cement industry category, the Permanente Cement Company was runner-up.

Costly Strike Cuts Profits Of Potash Co. of America

G. F. Coope, president of the Potash Company of America, recently stated that the strike which halted production at the firm's Carlsbad, N. M., operation last year had caused the first break in the upward trend of its output and earnings since 1939. According to Mr. Coope, the net profits for the year ended June 30 came to $2,532,863, as compared with $2,642,178 last year. He declared that the strike of the International Mine, Mill, and Smelter Workers cost the firm $750,000 and the average worker $900.

A more optimistic note was struck in the official's statement that customers are increasing their orders and that prospects for domestic potash consumption are "quite good."

Premier J. B. McNair has announced that the Canada Cement Company is planning to proceed soon with construction of a cement-manufacturing plant in New Brunswick. The plant, expected to cost several million dollars, will produce 600,000 barrels of cement annually, he said.

WASHINGTON NEWS LETTER

By S. HERBERT UNTERBERGER

THERE has always been some lack of understanding between Washington and the rest of the country. The average citizen often regards government officials with suspicion. On the other hand, the officials feel that their work is neither understood nor appreciated.

This lack of communication between the capital and the rest of the country becomes especially serious in times of crisis. Because they are unable accurately to predict the public's response, government officials are often timid when they should be forthright and forceful when they should be circumspect. For the most part, they are never sure whether they are ahead of the country in their thinking, or whether the country is ahead of them.

When President Truman took the bold step of ordering armed help for the embattled South Koreans, it was broadly predicted in Washington that this would be a serious blunder. It turned out, however, that his action received overwhelming popular support. This demonstrated that the nation as a whole was well aware of the dangers of Communism on the march and was perfectly prepared to do something about it. On this issue the country was ahead of Washington.

Similarly, the President's reticence about asking for the power to control prices and wages appeared to be another misconception of the temper of the public. Washington officials apparently reasoned that price and wage controls were unpopular during the last war. They remembered that one of the principal reasons why the control of the 80th Congress passed to the Republicans was that the public wanted to be rid of price controls. But here, too, Washington did not understand that public opinion is a flexible thing. It was public clamor which led to the inclusion of price and wage control powers in the Defense Production Act of 1950. The public was quick to sense the difference between the end of a war and the beginning of a long period of continuous remobilization. On this issue, also, the public appeared to be ahead of Washington.

Once more, Washington is very uncertain about public reaction. At this writing it appears that the most serious part of the Korean war is about over. And Washington fears that the public will be unwilling to accept the accelerated mobilization program. This accounts for the large scale propaganda campaign emanating from Washington these days. Cabinet officers and other high government officials are making as many speeches and issuing as many statements as they can proclaiming that Korea is not the end; that there is still a long hard row to hoe.

It is likely that Washington is again misjudging the public's understanding of the real issues. Certainly, only the most ill-informed could have thought that Congress authorized the expenditure of $30,000,000,000 in the next 8 months to defeat North Korea. Obviously there are bigger enemies, and everybody knows who they are.

What is far more likely is that the nation as a whole is ready and willing to see the defense program through; and the real ability to see it through is found only outside of Washington. No airplanes, no ordnance and no ships are made here. Increased taxes are never popular, nor are price and wage controls desirable. But the fear of atomic bombs falling on undefended cities is far more unpopular; and the rapid spread of totalitarianism is far more undesirable. It would surprise official Washington, but not the rest of the United States, to find that these matters are understood very well and very broadly.

Regardless of the degree of understanding that may exist, the fact remains that Washington, and only Washington, can direct the remobilization program. Here the most serious problem holding up progress is the shortage of skilled manpower in government. It is hard to believe that it happened so quickly, but in the five years since the end of World War II, there has been an almost complete change of personnel in official Washington. This means that little use is being made of the know-how so expensively acquired during the last war. It is regrettable but true that many errors are being repeated. Perhaps one of the most serious of these is the error of waiting too long before taking action—the error of doing "too little and too late".

The fact of the matter is that it is almost impossible to get "good" people to come to Washington. Even though government salaries have been raised somewhat, they are still not high enough to attract people away from their regular jobs. But this is not the principal problem. In the last war many able men came to Washington to contribute to the war effort with the virtual assurance that their stay was temporary. Their regular employers were prepared to give them up, or they were willing to leave their own businesses, or otherwise to interrupt their careers because it was to be for only a short while. However, there is no assurance that the present emergency is of a temporary character. The likelihood is entirely the other way. The present defense effort is expected to last many years.

Properly, such long range programs should be manned by government career employees. Recently some top positions have actually gone to such employees. The present Postmaster-General and Secretary of the Interior are persons who have had a long history of government service in their departments. It is rare, however, for a career employee to attain sufficient stature to command a really key job. By the very nature of its operation, the government has not been able to train its employees for top jobs. For many key jobs, the choice is boiling down to promoting a person already in the government or accepting less than first-rate people from elsewhere.

Despite the obstacles, the job is going ahead, but slowly. So far, orders have been issued to prevent or at least discourage the hoarding of inventories. The initial order was very general; it merely announced the possibility of penalties for businessmen who accumulated inventories beyond the normal requirements for the volume of business they are doing. This order is full of loopholes and will be effective only against the most flagrant hoarders. As soon as there is enough staff to do the work, a more specific order is sure to follow. It would be no surprise if, in the not too distant future, businessmen will be called upon to declare their inventories and to report the changes since pre-Korea. If necessary, the requisition of excess inventories may follow.

(*Continued on page 78*)

Well-Designed Ohio Plant Crushes, Screens Dolomitic Limestone at 125 T. P. H. Clip—Company New in Field

By WILLIAM M. AVERY

another ON THE SPOT report

AN exceptionally well equipped and efficient plant for crushing and screening high-grade dolomitic limestone went into production several weeks ago near Carey, O., a small community located about 30 miles northwest of Marion. The new plant, which was placed in operation early in August, is owned and operated by Wyandot Dolomite, Inc., a newly formed organization with home offices in Findlay, O. Its primary products are fluxing stone, road stone and ballast, concrete aggregate, and agricultural limestone. Operations to date have shown an average output of 125 t.p.h.

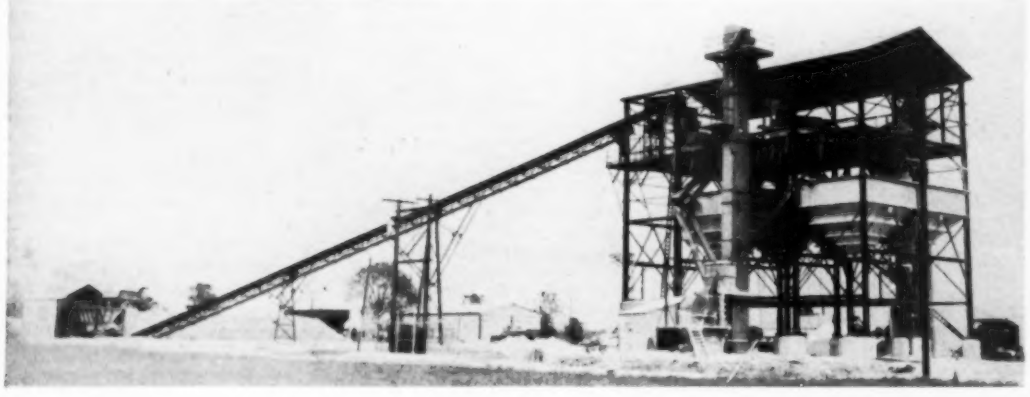
Of particular interest in this outstanding plant is the first installation of Eagle Crusher Company's new 36- by 42-in. hammermill. This unit is placed in the circuit as a secondary crusher, with screens so arranged that the entire flow can be sent to the hammermill, or so that fines can be by-passed. An exceptionally versatile piece of equipment, it is said to produce efficiently any size material from 3-in. stone down to agricultural limestone, with capacities ranging from 250 t.p.h. when impact bars are used for larger stone, down to 100 t.p.h. when producing fine material.

• This view of the Wyandot Dolomite plant near Carey, O., shows the arrangement of storage bins, and the alternate method for producing agricultural limestone.

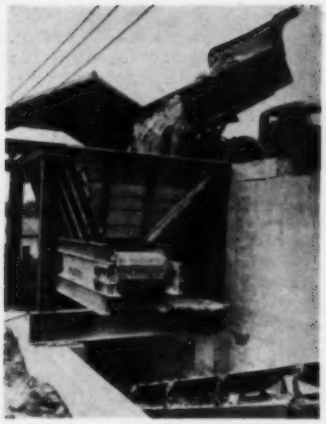
• Blasting is handled by technicians of the Atlas Powder Company. Here two members of the blasting crew, James B. Walker (left), and John C. Blair (right), flank W. C. Reiff, superintendent of the plant. Since this picture was taken, Mr. Blair has joined the "Navy's police force," formerly known as the U. S. Marines.

• A general view of the well-designed crushing and screening plant of Wyandot Dolomite which went into production recently. The primary crusher is at the extreme left.

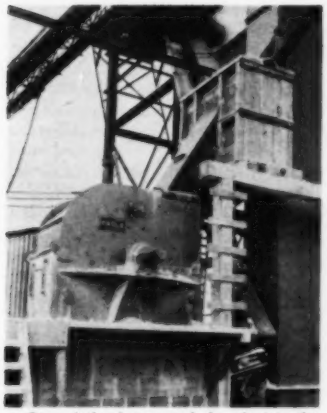
In the Wyandot installation the Eagle hammermill is being used primarily for coarse secondary crushing, since there is another unit in the plant used altogether for making agricultural limestone. Control of the size of output is maintained by means of a drum control on the 200-hp. Westinghouse variable speed



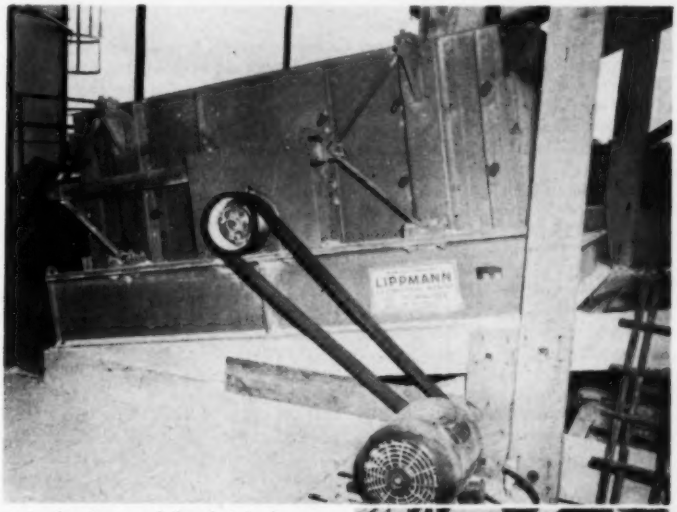
• At the quarry face stone is loaded into 2-ton dump trucks with a 2-cu. yd. diesel-powered shovel. Ultimately the face will have a height of about 45 ft.



• One of the trucks dumping into the 36-in. by 12-ft. apron feeder ahead of the primary crusher.



• One of the features of the plant is this 36- by 42-in. hammermill, which is placed in the circuit as a secondary crusher.

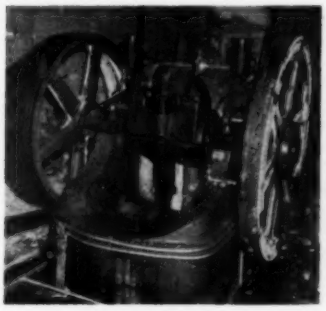


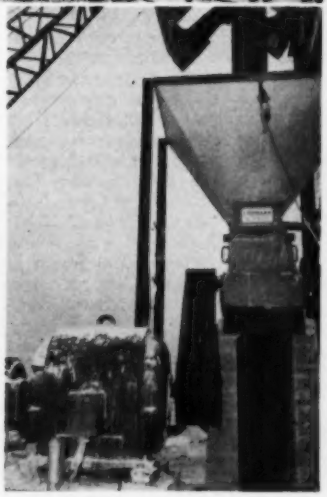
• Another feature of the plant is the unusually large screening surface provided. Four screens of the type shown here provide a total screening surface of over 400 sq. ft.

• Right: A closeup of the 32- by 24-in. hammermill, which is used entirely for producing agricultural limestone. The hopper over the mill is fed by gravity from a screen in the plant, or by clamshell on the night shift.

• Looking up the 24-in. by 220-ft. inclined belt conveyor which moves stone from the primary crusher to the top of the plant.

• Right: A view of the 24- by 36-in. primary jaw crusher. Crushed materials and by-passed fines drop onto the 24-in. conveyor which feeds the plant.





drive motor, the motor being slowed down when coarser stone is desired. The interchangeable breaker plates are also adjustable from the outside of the machine. When operated with impact bars, the machine produces a cubed product which is readily accepted as No. 1 state highway material.

Another feature of the plant is the unusually large screening surface provided. The four vibrating screens at the top of the plant, all manufactured by the Lippmann Engineering Works, provide a total screening surface of over 400 sq. ft., which may well be some sort of record for a plant of this size. Although no two of the screens are identical in respect to number and size of decks, all are equipped with heavy-duty shafts of the same diameter, and utilize identical bearings, a provision which makes possible an important saving in spare parts inventory. Lippmann, through their distributor, The Lorenz Equipment Co. of Columbus, O., also supplied the feeder ahead of the primary crusher, the 32- by 24-in. hammermill used for making agricultural limestone, and the idlers and pulleys for the short conveyors in the plant proper.

The Wyandot plant is located on a 100-acre property which is largely underlaid with limestone. Partial core drilling of the property indicates reserves sufficient for at least 35 years. Overburden, consisting of loam and clay, runs up to 6 ft. in depth, with 4½ ft. representing a fair average. Initial stripping, sufficient to permit opening up the quarry and to provide fill required at the plant site, was done by a contractor, using Le Tourneau scrapers drawn by Caterpillar tractors.

Present plans call for opening the quarry face to a depth of about 45 ft. When this development has been completed, it is planned to shoot up to 30 holes in each primary blast, using either a single- or a double-row pattern. The 6-in. blast holes are put down with a Loomis K-4 well drill. All blasting is handled by technicians of the Atlas Powder Co., working out of that company's Pittsburgh field office. Up to six Rockmaster delays are used in the operations, with such excellent results in respect to breakage that no secondary shooting has been required to date.

The stone is loaded into 2-ton Dodge end-dump trucks with a Bucyrus-Erie 51B shovel equipped with a 2-cu. yd. dipper. The shovel is powered by a Caterpillar D17000 engine. Two trucks provide sufficient capacity at present, since the haul to the primary crusher is less than a hundred yards.

The trucks dump from the top of a ramp into a hopper mounted over a 36-in. by 12-ft. Lippmann apron feeder, driven through a gear reduction unit by a 5-hp. motor. Push button stop-and-start controls permit a man stationed at the crusher to regulate the feed. The feeder discharges over a grizzly which permits fine stone to by-pass the crusher and fall onto the plant feed conveyor.

The primary crusher is a 24- by 36-in. Traylor jaw, the opening of which is set at 6 in. Crushed material, as well as the by-passed fines, drop onto a 24-in. wide by 220-ft. centers belt conveyor which is inclined at 17 deg. Built by the Fairfield Engineering Co., this conveyor is fitted with U. S. Rubber belting, and the idlers and pulleys were supplied by Chain Belt. Corrugated steel covers are being installed to provide weather protection over the entire length of the belt.

At the top of the plant proper the conveyor discharges the stone on a triple-deck 4- by 8-ft. Lippmann vibrating screen, from which oversize material and the middle-deck product are fed by means of a gravity chute to the 36- by 42-in. Eagle hammermill. Fines can also be chuted to the mill, or they can by-pass it, going directly into the bucket elevator which closes the mill circuit. The mill discharge drops onto a short feeder belt which discharges into the boot of the elevator.

Re-elevated to the top level of the plant, the stone passes over a 4- by 12-ft. triple-deck screen. Oversize from this screen, and also the middle-deck product, are normally fed back to the Eagle mill through a gravity chute. Rejects from the bottom deck (ballast-sized material) drop directly into a bin below the screen, while the throughs drop onto a short inclined belt conveyor which feeds the No. 3 screen, a 4- by 12-ft. double-deck unit.

Products of the third screen are minus 13/16- plus 7/16- in., minus 7/16- plus ¼-in., and ¼-in. down to dust. By means of gates located at the discharge end of the screen any desired fraction of the coarse material may be directed from the bins into a small hopper from which the Lippmann hammermill is fed.

As mentioned earlier, this 32- by 24-in. hammermill is used entirely for producing agricultural limestone. Its output with the present 150-hp. Westinghouse drive motor is about 50 t.p.h. The mill operates whenever the plant is running, and additional output is obtained, when desired, by a night shift operation in which the hopper is fed by a Bucyrus-Erie 22B clamshell crane. Stone for this purpose is drawn from the plant bins into a truck and dumped on the ground near the mill.

The hammermill product is elevated to the upper level of the plant and discharged on the No. 4 screen, a 4- by 10-ft. double-deck unit. A small amount of oversize is returned to the mill, while No. 9 stone and agricultural limestone go directly to separate bins.

Storage facilities at the Wyandot plant consist of six 100-ton Butler steel bins. Only one of these is partitioned at present, but it is planned to divide at least one additional bin in order to accommodate more sizes of material. There are also large areas at both ends of the plant which will be utilized for stockpiling. Materials will be trucked to these areas from the plant bins and reloaded with cranes.

A small portion of the output of the plant is loaded into trucks for local customers, but the bulk of the tonnage is shipped by rail. The plant is served by the New York Central, with switching facilities to the Chesapeake & Ohio and the Akron, Canton & Youngstown lines. Cars are handled on a 2000-ft. siding which has sufficient slope for gravity movement away from the plant.

Other auxiliary plant facilities include a well-equipped machine shop building for maintenance and repair work. This exceptionally neat looking structure was built of prefabricated interlocking steel panels made by United Steel Fabricators.

The sound planning and engineering that went into the Wyandot plant are indicated by the fact that the entire operation, including the quarry, is carried on with a crew of only 11 men. Duplicate push-button controls have been provided at ground level, where the switch gear is located, and at the top of the plant, so that the various units of equipment may be started and stopped from either location. The control system is fully interlocked. When any unit stops, all others behind it stop automatically, while those ahead of it continue operating to clear the plant of stone. All motors in the plant are Westinghouse. The Toledo Engineering Company handled all the design work in connection with the project.

Officials of Wyandot Dolomite are B. B. Brumley, chairman of the board of directors, V. G. Lytle, president and general manager, John W. Grimm, vice-president, Edward Lybarger, secretary, and Dr. Robert E. Carrigan, treasurer. W. C. Reiff is plant superintendent.

A view of Rhodesia Cement Limited's facilities at Colleen Bawn, Southern Rhodesia, showing (left to right) stores and repair shop, raw material storage with kiln feed silo (rear), raw meal mixing silos, mill house, cement silos and packing shed.

Modern Plant of Rhodesia Cement Planned to Accommodate Expansion

MODERN design and future expansion were prime considerations in the layout and construction of the new cement plant of Rhodesia Cement, Ltd., located at Colleen Bawn in Southern Rhodesia. The formal opening of the plant on July 22, 1949, represented another step in the expansion which the African cement industry as a whole has undergone in recent years.

Operating on the dry process in conjunction with a Lepol kiln, the plant was laid out with adequate provision for adding another kiln and expanding mill facilities at a later date. The quarry, now working a single 8-hour shift, will add another 8-hour shift when increased output is desired.

Colleen Bawn is about 100 miles south of Bulawayo on the railway line which connects Bulawayo with West Nicholson. Electrical power is obtained from the 33,000-volt lines of the Gwanda Power Station, operated by the Electrical Supply Commission of Southern Rhodesia. The water supply is at present taken from boreholes (wells) and storage dams on the property, but in the near future a bulk supply of water will be obtained from the new Umzingwane Dam, situated about 9 miles from the plant.

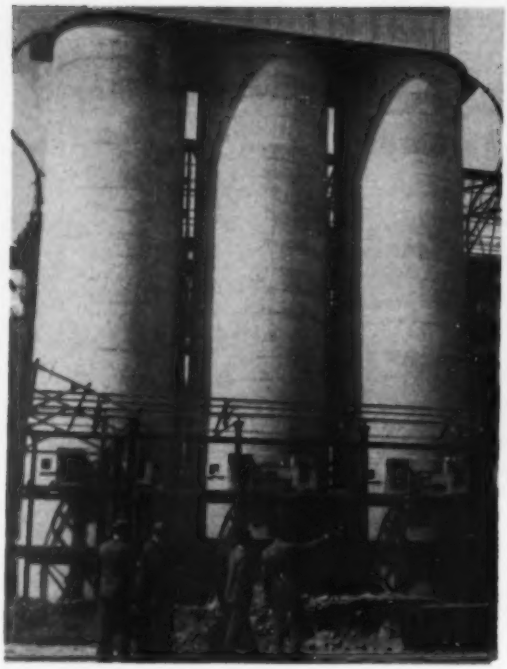
Quarry Located at a distance of about 500 ft. from the plant proper, the high-grade limestone deposit is worked by the "glory hole" method, which enables selective mining from any point in the 300-ft. hill which forms the deposit. The contact wall consists of shale suitable for use in the manufacturing process.

A main adit was driven into the hill, from which drives branch off at right angles to the right and left. These are equipped with loading bins and a rail system for the mine cars. At intervals of about 300-ft. "glory holes" have been driven from the top level down to the main cross drive, a depth of 110 ft. The quarrying is done on individual levels about 110 ft. above each other. Rock blasted around the "glory hole" is conveyed to these 10-ft. diameter holes (raises) by scraper hoists, falls down 110 ft., and is then collected in open cocopan trucks (mine cars). These are hauled out by diesel locomotive and brought to the reinforced concrete receiving hopper located outside on the slope of the hill.

Crushing This hopper is situated above the Utah electric vibrating feeder which discharges by gravity to the 13-in. Allis-Chalmers McCully primary crusher. From this point the material is carried by a short belt conveyor to a vibrating screen that feeds a 4-ft. Symons cone crusher for secondary reduction.

The ⅜- to ½-in. product of the Symons crusher is carried by a 700-ft. belt conveyor down to the 400- by 70-ft. raw material storage building which is equipped with an A.S.E.A. overhead crane with a 7½ ton grab (clamshell bucket). If so desired, the material coming from the belt conveyor can be fed, by means of two auxiliary conveyors, directly into the feed bins of the raw mills.

Raw Grinding The limestone from the rawmill bins falls onto a No. 330 Jeffrey vibrating feeder, while a Jeffrey No. 220 vibrating feeder handles the shale. Both feeders are equipped with Waytrol weighing mechanisms and discharge into a specially-constructed 10- by 24½-ft. semi-air-swept raw mill equipped with a predrying chamber. This mill is manufactured by the Electro-Mechanical Construction Company, and is known as the E.M.C. "Double Rotator." Common peripheral discharge of this two-compartment mill to a bucket elevator is accomplished through openings in the shell between the dividing diaphragms. The elevator feeds into two Sturtevant air separators. The grit from these separators is returned to either of the two compartments of the mill by a return screw for further grinding. The mill is driven by a 600-hp. First Electric Corporation auto-synchronous motor with an .8 leading power factor.



• Before the raw meal mixing silos are (left to right): R. Sharples, secretary; B. L. Gardiner, director; C. Dodd, general manager; Sir Godfrey Huggins, Prime Minister of Southern Rhodesia; and L. M. Baerveldt, consulting engineer.

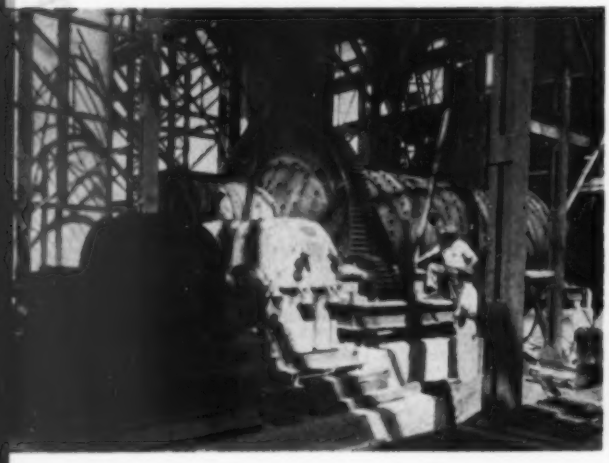
• At the top, the quarry compressor house; on the hillside, the reinforced concrete bunker, the primary crusher and below it the secondary crusher; in the foreground, the 700-ft. belt conveyor.

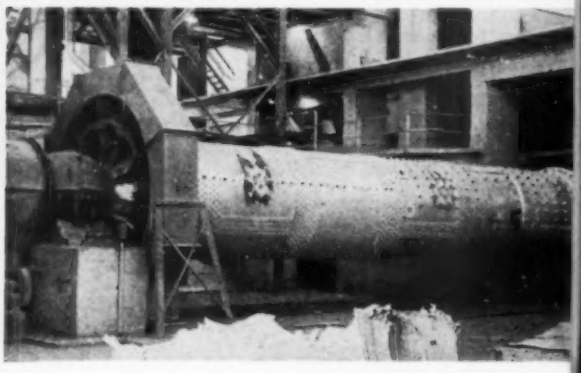
The raw grinding mill is connected to both a Norblo cyclone for collection of the coarser dust particles and to an E.M.C. bag-type collector.

The end product of the cyclone, the bag dust collector, and the air separators is brought into 16-in. E.M.C. pneumatic conveying troughs operated by small ventilators requiring only about 1/10 of the power that would be consumed by other means of transport. The material is then conveyed into one of the two E.M.C. Cera pumps, which in turn pneumatically feed the three flat-bottom raw meal mixing silos, each equipped with overflow indicators 16½ by 60 ft. and pneumatic aerating tiles and discharge valves. Two E.M.C. 20-in. pneumatic conveying troughs run adjacent to these silos, enabling the operator to feed the raw mix to any one of the E.M.C. Cera pumps for mixing or to convey it directly to the kiln feed silo.

The final 25½- dia. by 60-ft. high raw mix storage and kiln feed silo is also equipped with aerating tiles, pneumatic conveying troughs, and discharge valves, all operated by low-pressure air.

Kiln A bucket elevator carries the raw mix from the silo to a small storage bin located directly in front of the Lepol kiln Hydroballer (nodulizer). The Hydroballer is 7 ft., 10 in. in diameter and 16 ft., 5 in. in length, runs on two riding rings and is driven by an F.E.C. motor through a double reduction Benoni Engineering Works helical gear reducer. The grate is 8 ft. wide and 45 ft., 11-in. long and is connected to a Davidson-Brown exhaust fan placed be-





• Left: The semi-airswept raw mill, with the bucket elevator and two air separators, the double helical reduction gear box, and the 600-hp. auto-synchronous motor.
• Below: The three-compartment cement mill, with additional air intake between the second and third chambers. In the background are reinforced concrete feed bins.

• The pneumatic discharge valve from one of the four flat-bottom cement silos to the pneumatic conveying trough. A bucket elevator feeds to the packers.

hind a Buell cyclone dust collector.

The coal-fired kiln itself is 9 ft., 10 in. in diameter and 98 ft., 5 in. in length and runs on two riding rings. These rings in turn run on four riding ring rollers, each shaft of which is supported by two double self-aligning bearings equipped with scoop lubrication.

The coal firing fan is a Safanco high-pressure centrifugal fan. The coal itself is ground in an E.M.C. airswept tube mill which is fitted with an external air separator. Coal dust is collected in a cyclone and hopper and is fed to the coal-firing pipe by a star feeder, while the finest coal dust which is not collected in the cyclone is blown into the kiln with the primary air.

This fuel-feeding arrangement allows for a storage capacity of pulverized coal in case a breakdown occurs in the tube mill.

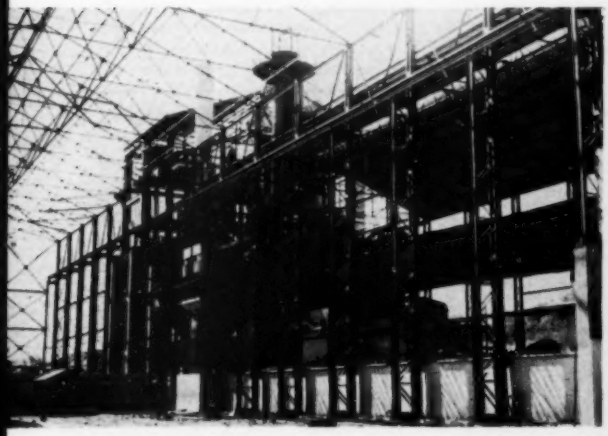
Cooling The rotary cooler used is 8 ft., 3 in. in dia. by 64 ft., 4 in., long and is equipped in the first third of its length with firebrick, in the second third with firebricks and lifters, and in the last third with a butterfly arrangement. This setup very efficiently cools the clinker. Otherwise, the cooler is similar in construction to the kiln. A 35-ft. Jeffrey electric vibrating feeder conveys the clinker to a pit in the clinker storage section of the raw material building from which it is transferred by the overhead crane to concrete bunkers.

Finish Grinding A Jeffrey Waytrol No. 330 feeder feeds the clinker and a No. 220 feeds the gypsum into the finish grinding mill. This 3-compartment mill is a 7-ft., 3-in. by 42½-ft. E.M.C. and is driven by a 700-hp. auto-synchronous First Electric Corporation motor. Diaphragms are situated between the second and third compartments to allow additional moisture and dust-free cooling air to be drawn in by the induced draft fan of an E.M.C. bag-type filter.

Storage The finished cement is pumped through 10-in. pneumatic conveying troughs by a Cera double-vessel automatic pump to the storage silos. There are four of these silos, each 25½ by 60 ft. All are equipped with aerating tiles and pneumatic conveying troughs which are connected to pneumatic discharge valves. The cement is fed by these 10-in. troughs to a bucket elevator which feeds the surge bin of the two St. Regis 2-spout packers. A conveyor belt transfers the 94-lb. bags of cement from the packhouse to railway trucks (freight cars) or motor lorries (trucks).

General The design and layout of the entire plant was under the direct supervision of I. M. Baerveldt, who was for 20 years resident engineer in South Africa for the firm of G. Polysius of Germany. Mr. Baerveldt is now consulting engineer for the Electro-

(*Continued on page 82*)



The raw material storage, 400 ft. by 70 ft., with the kiln house adjacent, showing the kiln, the grate (8 ft. wide and 45 ft. 11 in. long), and the cyclone dust collector.

Right: At the official dedication of Rhodesia Cement Limited's plant (left to right): L. M. Baerveldt, consulting engineer and president of Electro-Mechanical Construction Company, designers and builders of the plant; B. L. Gardiner, a director of Rhodesia Cement Ltd.; Sir Godfrey Huggins, prime minister of Southern Rhodesia; Charlie Dodd, general manager of Rhodesia Cement Ltd.; and L. A. Levy, a director of the firm.

Rapid Test Measures Sulphate Susceptibility of Portland Cement

A RAPID test for accurately measuring the susceptibility of portland cements to attack by sulphate ground waters has been developed by W. C. Taylor and R. H. Bogue at the National Bureau of Standards. The new procedure,* which determines the extent to which aluminates in the cement can react with the sulphate ions present, not only reduces the time required for the test from several weeks or months to one day, but also provides more valid results than methods previously used.

Some concrete structures deteriorate in the presence of ground waters containing soluble sulphates, while others do not. Where deterioration occurs, it appears to be due principally to a reaction between the sulphate ions in the ground water and the aluminate ions in the cement. In the presence of calcium hydroxide, crystals of calcium sulphoaluminate ($3CaO.Al_2O_3.3CaSO_4.31H_2O$) are formed. The resulting volume increase of about 227 percent may cause cracking and splitting of the structure.

Resistance to this type of deterioration may be induced either by the chemical nature of the cement or the physical character of the paste. Thus a dense paste which is nearly impermeable to the flow of solutions will remain sound in sulphate solutions much longer than a lean and porous mixture. Nevertheless, an improvement in structure merely slows down the rate of attack. Long-range resistance to sulphate attack can be attained only by using cement whose chemical composition makes it naturally resistant.

In the past the sulphate resistivities of various types of cements have been evaluated by preparing bars or slabs of mortar and noting their change in length, strength, or appearance after storing in sulphate solutions for periods up to several months. This procedure has two notable disadvantages: the time required is excessive, and the physical character of the specimen may have a pronounced effect on the results. The test developed at the Bureau, on the other hand, is made directly on portions of the cement, rather than on specimens of the paste. Thus it is possible to evaluate correctly the inherent resistance of the cement to sulphate action, as distinguished from the physical effects due to the nature of the specimen.

This test measures the amount of sulphate removed from solution in a definite time when a small sample of the cement (adjusted to a known sulphate content) is continuously shaken with a saturated lime-water solution. The sulphate in the cement dissolves quickly in the water-cement fluid mixture and reacts with the aluminates to form the difficultly soluble calcium sulphoaluminate. In the early period, which may be as long as two hours, the reaction proceeds rapidly, but after four hours it becomes much slower. After six hours, the concentration of sulphate in the solution changes so slowly that it can be measured with very little error. The difference between the original SO_3 content of the mixture and that of the liquid at six hours is then calculated as percentage of the SO_3 originally in the cement and is designated "sulphate reaction value". This value represents the amount of SO_3 that has been rendered insoluble by interaction with the aluminates and thus indicates the susceptibility of the cement to attack by sulphate waters.

Sulphate reaction values obtained for a large number of cements at the National Bureau of Standards have shown a high correlation with the behavior of concrete and mortar specimens of these cements that had been stored in sulphate solutions for some time. The rather striking results indicate that it is possible to separate cements into three groups with respect to their sulphate susceptibility. Thus, a cement having a sulphate reaction value up to 50 can be expected to have considerable resistance to sulphate attack. The lower the value, the greater will be the resistivity of the cement. Concrete or mortar structures made with such a cement will have satisfactory durability when exposed to sulphate waters except where disintegrative forces other than sulphate reaction may be involved.

At the other end of the scale, a cement having a sulphate reaction value above 65 can be considered relatively nonresistant to sulphate attack. Structures made with such a cement cannot be expected to last long when exposed to sulphate waters, regardless of the quality of the workmanship or the presence of beneficial agents.

Cements having sulphate reaction values between 50 and 65 are somewhat on the borderline. While they cannot in general be depended upon to resist sulphate attack, structures made of these cements may be durable in sulphate exposure if they are dense and impermeable and are free of other disintegrative agents. In this range of cements, good workmanship is absolutely necessary, and air entrainment would undoubtedly be beneficial.

*For further details, see *A Sulfate Susceptibility Test for Portland Cements*, by W. C. Taylor and R. H. Bogue, *J. Research NBS* 45, September, 1950, RP2128.

Washington News Letter

(*From page* 71)

Similarly, the initial orders regarding priorities are very general. Businessmen are supposed to give defense goods prior attention. How well this will be observed will depend primarily on how profitable defense orders are. For the most part, the prices of defense goods are controlled, or if the profit is exceptional, the contracts may be renegotiated. If the prices on non-defense goods remain uncontrolled and continue to rise, there will be a powerful temptation to make civilian goods. Should this happen, more detailed priority regulations are sure to follow.

At this writing, no price ceilings have been imposed. And if prices do not rise excessively, there may be no ceilings for a long time. Nevertheless, the government has already laid some of the groundwork for price and wage controls in the President's executive order which required that:

"(1) Every person who sold or delivered goods or services, or offered them for sale or delivery, in the course of trade or business during the period from May 24, 1950, to June 24, 1950, inclusive, shall preserve all his records for such period relating to:

"(a) The prices received or asked for such goods or services; and

"(b) The labor, material, acquisition, and other costs incurred in connection with such goods or services."

While this requirement suggests the possibility of a price roll-back, it is unlikely that that could be successfully accomplished at this late date. This information will probably be used to identify businessmen who have raised prices exorbitantly and to measure the relative increases in prices and wages when determining whether a wage increase is warranted.

New "Plurajet" Shaped Blasting Charge Ready for Industry

By LAUD S. BYERS
Explosives Engineer

IN the November, 1949, issue of PIT AND QUARRY an article appeared by the writer entitled "The Multiple-Jet Shaped Blasting Charge—Why It Functions." Immediately preceding this article was a new story with "before and after" photographs, each showing how boulders up to 20 tons were quickly shattered to crusher size by merely placing the shaped charges against them without artificial covering of any kind.

The resulting interest shown by the rock and mining industry was so intense that an all-out effort was made to increase the surprising performance of these charges and at the same time produce them at an ultimate cost to the operator consistent with the benefits he would receive. The engineering staff conducting the experiments was increased and several quarry operators enthusiastically offered their quarries as practical testing grounds. From all of this additional development work, a simpler, more efficient new type of "split-jet-shaped" blasting charge has been evolved, which is known as the "Plurajet." Patents have been granted and other patents are pending.

Concurrently with the additional knowledge gained in the use of the shaped-charge idea for shattering rock, the United States Government has made great strides in the further utilization of the shaped-charge principle for military weapons. Not only has the efficiency of the bazooka been greatly increased, but a new air-borne rocket known as the "Ram" has been developed, both weapons, according to reports, having aided U. N. armed forces in the Korean War.

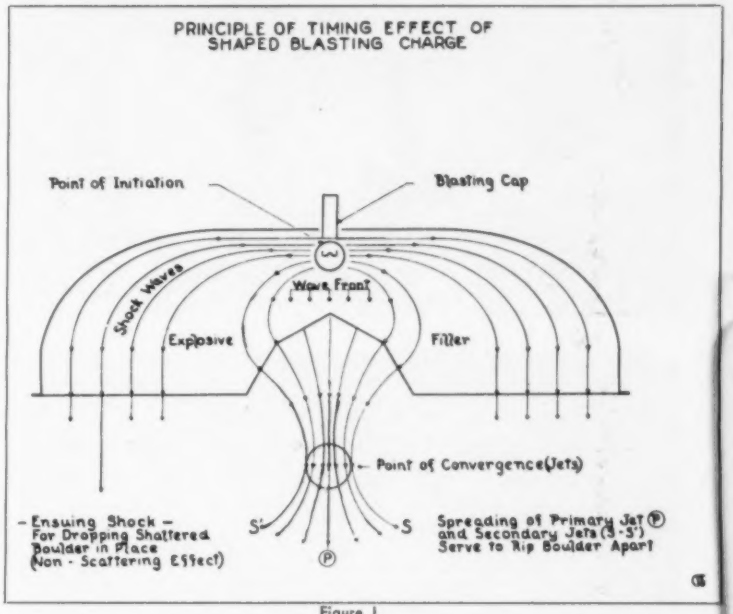

PRINCIPLE OF TIMING EFFECT OF SHAPED BLASTING CHARGE
Point of Initiation
Blasting Cap
Shock Waves
Wave Front
Explosive
Filler
Point of Convergence(Jets)
- Ensuing Shock - For Dropping Shattered Boulder in Place (Non - Scattering Effect)
S'
S
Spreading of Primary Jet (P) and Secondary Jets (S-S') Serve to Rip Boulder Apart
P

Figure 1

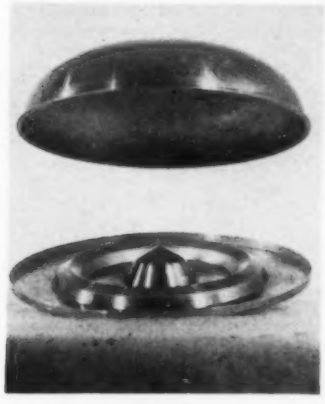


Figure 2

The so-called chain reaction of the Plurajet shaped blasting charge is illustrated in Figure 1. The charge is simply placed on a boulder and a conventional blasting cap is inserted. The method of firing may be by the usual No. 6 fuse cap, an electric exploder or by Primacord. In the case of the latter, no blasting cap is required except the one necessary to detonate the Primacord.

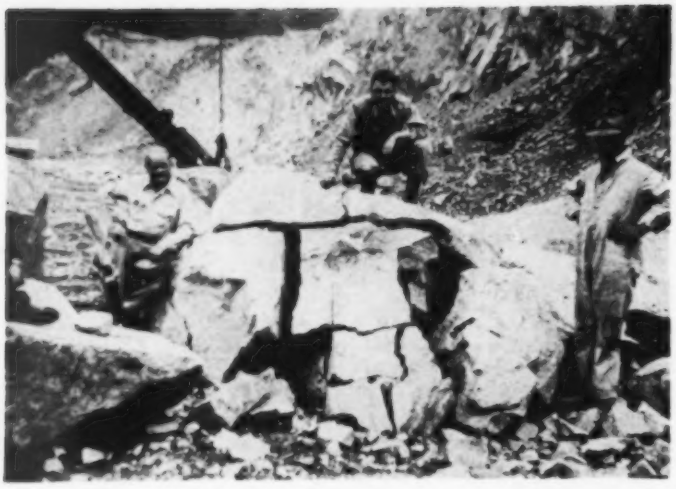
Three actions take place upon detonation: First, the wave front shown travels downward from the concentrated end of the blasting cap and collapses the top apex of the cavity, thereby creating the primary jet (P), which starts boring a hole into the boulder.

The second action is the collapsing of the side apexes, creating secondary jets (S-S_1) which meet and interfere with the primary jet at the point of convergence, as shown. The action of these excited gases at this point of convergence is that of an *implosion*, the effect of which serves to rip the boulder apart.

The third action, immediately following, is that of the shock waves, shown in the illustration, which have been deflected towards the boulder and serve the purpose of completing the shattering process. The blow struck is of such high intensity and of such short duration that the shattered pieces are dropped *in toto* before they have had a chance to pick up momentum and fly through the air.

Practically no wastage of explosive force occurs, due to the deflection of these shock waves towards the object to be blasted. It will be noted in the illustration that the top shape of the charge is in the form of an umbrella or a mushroom; and the principle of deflection is similar to the turning aside of a high-velocity bullet striking the twig of a tree, or similar to the deflection caused by the shape of the new United States Army helmets worn by our soldiers on the battle-line.

Figure 2 shows a type of Plurajet blasting unit where a blow of extraordinary striking power is required,



Left: Figure 3

Figure 4

such as on certain types of rock and metallic ores. The shape of this unit produces a blow four to five times that of the same explosive even when confined by mud-capping. It will be noted that the annular ring surrounding the central cavity is based on the same "split-jet" principle, and was found to have greater striking force than a circle of individual cavities surrounding the central one.

A graphic example of the sudden quick blow struck by this type of "Plurajet" charge can be seen in Figure 3. In this instance, a medium size charge was placed on the side of a dense granite boulder, weighing approximately 18 tons. The indentation where the charge was hung can be clearly seen in the photograph. This boulder was lying within 40 ft. of a new electric shovel worth $125,000, which was not moved prior to the blast. Although this boulder was hit on the side towards the shovel, the farthest fragment thrown was not more than 15 ft. from the point of explosion. After explosion the fragmented boulder dropped completely to pieces at the first touch of the shovel bucket. The observer standing to the right of the photograph is H. L. Purtill, plant superintendent, Granite Rock Company of Watsonville, Calif.

Comprehensive demonstrations of the new charge versus conventional methods of block-holing and mud-capping were made during May, 1950, at two different federal dam projects in southern Virginia, the Philpott Dam and Buggs Island Dam projects. At these demonstrations observers such as Fern Lambert of Lambert Brothers, Inc., A. D. Gorman of Gorman Brothers, and engineers from the United States Army Engineering Corps were present. The type of rock reduced was dense abrasive granite, and the results were highly conclusive.

Figures 4 and 5 show a demonstration recently made at the Strasburg, Va., quarry of William S. Frey, Industrial Limestone. At this demonstration four different sizes of blasting units were used—the two small "trimming units" for boulders from ½ ton to 3 tons each and the small and medium "blasting units" for boulders from 3 to 15 tons each. Sixteen boulders were shot simultaneously at this demonstration, using Primacord with a single No. 6 blasting cap to initiate it. One purpose of the demonstration was to

Left: Figure 5

show that the small fiberboard trimming units may be laced together on a single line of Primacord, in the manner of stringing beads. The observers shown in these two photographs are E. F. Alderton of North American Cement Corporation, Jack H. Kennedy and Arthur E. Coates of St. Louis and James R. Sharp of Washington, D. C. All of the boulders, the largest weighing 12 tons, were reduced 100 percent to crusher size.

Time-Saving Advantages

One of the many distinct advantages of this new blasting technique is the man-hours saved. In this demonstration just mentioned, at Strasburg, Va., 16 boulders from ½ ton to 12 tons each, weighing a total of approximately 80 tons, were broken to crusher size by the work of one man in 30 minutes. During this period, this one man placed the charges and hooked them together, ready for firing. The quarry operator estimated that it would have taken at least five times the man-hours to drill, load, hook-up, and fire these same boulders. This meant a great gain for production, as either the same man-hours could produce *greater* tonnage at the same cost, or the *same* tonnage at less labor cost.

As there were no broken pieces of rock thrown through the air, the shovel, which was only 60 ft. away, was not moved from the quarry floor, thus saving the time of the shovel operator and the wear and tear on equipment.

As there was no scattering of sharp pieces of rock from the blasts, it was not necessary for the bulldozer to clear the quarry floor for the waiting rubber-tired rock trucks, thus effecting a further saving in man-hours and use of equipment.

The safety factor to both men and equipment, by reason of the absence of flying fragments, is in itself an outstanding advantage.

Charging Overhead

Many operators, when estimating the expense of secondary blasting, miss many of the intangible expenses properly chargeable against such costs. For instance, in block-holing boulders, the tangible costs appear to be mostly those of the wages of jack-hammer men, the cost of jack-hammers, drill-bits and steel, and the dynamite that is loaded into the holes, together with blasting caps, fuses or wiring. In mud-capping or plastering boulders the tangible costs appear to be primarily those of the dynamite used, labor and firing.

Using the prevailing methods of secondary blasting, the intangible costs chargeable against each ton of rock broken and delivered to the crusher represent a very substantial sum total. These include the following: (a) the cost of air for the jack-hammers used in drilling boulders; (b) the cost of the drilling-bits and the amortization of the cost of the jackhammers, hose and all such equipment necessary for block-holing boulders; (c) the cost of moving power shovels, compressors, and other equipment away from their working positions, in order to be safe from flying fragments, plus the cost of moving the equipment back again before work can be resumed; (d) the cost of bulldozers having to gather together the scattered pieces of blasted boulders and to clear these sharp pieces out of the way for the rubber-tired dump trucks; and (e) the time and wear and tear on costly shovels having to fight boulders and keep moving them out of the way until drilling and blasting crews can come in and shoot them, while the idle trucks stand by waiting for their loads. It is an admitted fact that a large percentage of shovel break-downs are caused by having to fight boulders and buried "toes," with a serious and costly loss of production.

A great proportion of these intangible costs can be eliminated by the use of this new blasting technique.

The noise created by the explosion of the "Plurajet" shaped blasting charges is somewhat greater than that of block-holing boulders, per ton of rock broken, but is less than that of mud-capping. The concussion itself, however, is a different type from that set up by either of these two methods. In a concussion test recently made, where 32 "Plurajet" shaped blasting charges were fired simultaneously, window panes were set up at 100 ft., 150 ft., and 200 ft. surrounding the group of boulders being blasted. None of the glass window panes was broken or cracked.

These charges can be "custom-built" to fit any special requirement of the operator, for rock, stone, or mineral ores, on the surface or underground. The explosive filler is in a high classification as to absence of toxic fumes.

To supply the rock and mining industry with these charges in commercial quantities, a closed corporation has been organized, known as Shaped Charge Explosive Manufacturers, Inc., Post Office Box 682, Martinsburg, W. Va.* The firm's officials have announced that its engineers will be glad, upon request, to demonstrate these new charges to quarry and mining operators without obligation.

*See page 114 for an illustrated description of the plant—Editor.

Expert Gives Tips on Storing Power Equipment Engines

Producers of nonmetallic minerals and those in related industries can put their power equipment engines "in mothballs" during idle spells by methods developed for the protection of military vehicles in storage, according to N. T. Brenner, chief fuels and lubricants engineer, tractor section, Gulf Oil Corporation.

Trucks, bulldozers, and other gasoline- or diesel-driven vehicles in intermittent use will benefit from these fully proven lay-up procedures, Mr. Brenner asserted. Life is lengthened, operation improved, and cleanliness of internal parts guarded. The necessity of overhaul to correct rusting and corrosion caused by temporary lay-up is eliminated.

This protective procedure is made possible by special oils, such as Gulf No-Rust Engine Oil, Grades No. I and II, created for military use during the last ten years, but now commercially available, Mr. Brenner said. Application is simple and requires no special equipment.

Here are directions he gives for best results with gasoline and diesel engines:

Gasoline engines: drain the crankcase when warm, fill to normal operating level with the protective oil, run the engine 20 to 30 minutes at 1/3 to 1/2 normal operating speed. To protect cylinder walls, piston rings and valves, shut off the ignition, spray 2 ounces of the oil into each cylinder through the sparkplug hole while rotating the engine by hand or by the starter (at least five complete revolutions of the crankshaft). Apply oil to metal parts of sparkplugs, including points and threads.

Diesel engines: follow same procedure for crankcase as with gasoline engines. Remove fuel injectors if possible, and spray at least 2 ounces of no-rust oil into each cylinder to protect piston heads and valves. Rotate the engine as recommended for gasoline engines. Apply oil to threads and bodies of injectors.

Fuel system of all engines: remove as much fuel as possible from the tank and run the engine without a load until it stops for lack of fuel. No fuel should be left in the fuel system during storage.

Spray the inside of the tank and filler cap threads with protective oil. In addition, thoroughly lubricate engine accessories. Completely drain the cooling system.

Since the no-rust oils are formulated to serve for a considerable time in place of regular lubricants, the engine may be run on the no-rust oil without drainage when it is taken out of storage, until convenient to change.

Protective oils should also be applied to exposed engine metal, such as water pump shafts or places where paint has cracked off, to provide an anti-rust coating.

Gravel Plant Processes Gold-Diggers' Tailings

By HARRY F. UTLEY

A HALF-CENTURY ago placer miners toiled for gold along Yreka Creek, near the northern California town of the same name, leaving in their wake the inevitable piles of tailings. These piles are currently being processed for commercial aggregates at a small but unusual plant set up in 1949 by the firm of Yeager & Maloy, a few miles north of Yreka.

A ½-cu. yd. dragline first excavated a pond in an area where tests proved that good sand and gravel tailings existed to a depth of 8 or 10 ft. A barge was then built, using four navy surplus rafts as supporting pontoons. On the barge the operators installed a 6-in. centrifugal pump and a revolving screen with 3-in. openings. The dragline, operating on the bank, digs below water and discharges to a chute supplying the screen, plus 3-in. rejects being wasted. The throughs pass to a sump from which they are pumped to the screening plant 300 ft. distant through a 6-in. steel pipeline. Two additional pairs of pontoons support the pipeline until it reaches the shore.

The relatively large volume of water which carries the sand and gravel to the plant through the pipe washes and scrubs the material enroute. The material is discharged to a Pioneer double-deck screen which takes two or three sizes of gravel as finished material. The sand passing the lower deck is dewatered in a conventional sand drag. The sized aggregates go to truck loading bins for delivery or for short haul by a dump truck to adjacent storage piles.

The plant has been operating intermittently, depending upon the demand for the material in road work, and for building construction in the Yreka area. Production has been averaging approximately 125 tons per day.

• This 6-in. pipeline, supported by two pontoons, carries the sand and gravel to the screening plant at the Yeager & Maloy facilities near Yreka, Calif.

• The barge and dragline are here operating on the opposite side of a pond formed by Yreka Creek.

Rhodesia Cement

(*From page 77*)

Mechanical Construction Company, (Pty) Ltd., of Johannesburg, who handled the plant layout, manufacture of all the machinery, the structural steel design, all reinforced concrete work, and the construction of the buildings. The E.M.C. Company was started soon after World War II, basing much of their work on the well known Polysius designs, but including many of their own improvements.

Durham, North Carolina Firm Operating New Facilities

According to the *Wall Street Journal*, the Nello L. Teer Manufacturing Company, Durham, N. C., a rock crushing and contracting firm, has opened a new rock crushing plant and an asphalt mixing plant.

Nello L. Teer, president, stated that 250 persons would be employed in the new facilities. He added that the rock crushing installation has a capacity of about 2,000 tons per day, and that it serves customers within a radius of 35 miles.

N. S. G. A. Directors' Business Meeting Held at Sun Valley

another ON THE SPOT report

By WALTER E. TRAUFFER

THE board of directors of the National Sand and Gravel Association held its semi-annual meeting on September 26, 1950, at Sun Valley Lodge, Sun Valley, Idaho. The board of the National Ready Mixed Concrete Association met there a day earlier, and a joint meeting was held on the following day. In attendance at this meeting were 20 of the 37 directors, most of them with their wives and other members of their families. All members of the executive committee were there, as were also five ex-presidents. The meeting was an important one in the light of the many developments currently affecting the industry; and the choice of a site met with the unqualified approval of all. From the standpoint of scenery, accommodations, food, service, recreational facilities, etc., Sun Valley leaves little to be desired, and the program, without slighting business, gave everyone an opportunity to sample the attractions which appealed to him the most.

Harris N. Snyder (Buffalo Slag Co.), president, opened the meeting with a brief address in which he pointed out some of the developments which the near future may hold for the industry and warned members that they may soon be subject to controls similar to those imposed during the last war. The industry, he said, seems to be in very good shape to meet almost any demands which may be made of it; and the association is similarly well situated, financially and otherwise. N.S.G.A. has acquired 11 new members since the convention last February, making a total of 197 active and 71 associate members.

Morgan R. Butler (Butler Bin Co.), chairman of the Manufacturers' Division, expressed the complete satisfaction of the machinery manufacturers with the way the machinery exhibition was handled at the last convention, and also with the size of the producer attendance and the interest shown by them. He also stated that the board of directors of the division recommended that the

• Harris N. Snyder (Buffalo Slag Co., Buffalo, N. Y.), president of N.S.G.A., and Mrs. Snyder.

1954 annual convention be held in Cleveland, with a joint exhibition in one week for the sand and gravel, ready-mixed concrete, crushed stone, and agricultural limestone associations. It was proposed also that the slag association be invited to cooperate. The N.S.G.A. board voted to appoint a committee to study this proposal.

The program of the next annual convention, to be held at the Roosevelt Hotel, New Orleans, La., February 12 to 15, 1951, was discussed at the joint meeting of the two boards on September 27. The executive committees of both associations will meet on Saturday, February 10. On Sunday the two boards are invited by Herbert Jahncke to visit the Jahncke estate north of the city, where one of the features will be a real Southern barbecue. On Monday, February 12, both boards will hold their meetings—one in the morning and one in the afternoon, with a joint luncheon.

The first day of the actual convention will be Tuesday, February 13. It was suggested that there be a joint general session in the morning, with the sand-and-gravel operating meeting in the afternoon, and possibly a simultaneous round table discussion on financial and legislative matters. It was proposed that a joint session be held on Wednesday morning, to be devoted to a round table on emergency regulations. There would be a joint luncheon, followed by an N.R.M.C.A. operating session in the afternoon and a simultaneous one on merchandising problems in the sand-and-gravel industry. Thursday, February 15, would see the closing sessions for both groups, sand and gravel in the morning and ready-mixed concrete in the afternoon.

Herbert Jahncke has been working hard on the entertainment program, and it is apparent that it will

• In this distinguished group at the barbecue are Mr. and Mrs. Robert Mitchell (Consolidated Rock Products Co., Los Angeles); Mrs. Parker; J. Rutledge Hill (Gifford-Hill & Co., Inc., Dallas, Tex.); and Mr. and Mrs. Alexander Foster Jr. (The Warner Company, Philadelphia).

• Fred Bellamy taking off on the ski lift.

be one long to be remembered, especially by the ladies. On Monday there will be a luncheon for the ladies in the French Quarter. On Tuesday there will be conducted tours of the many beautiful and historic old homes and gardens under the supervision of Mrs. Jahncke. On Wednesday there will be a joint luncheon to which the ladies are particularly invited and at which the mayor of New Orleans will probably be the speaker. Late that afternoon there will be a four-hour boat tour of the harbor, with a buffet supper on board. There will also be a bar, an orchestra, and dancing. There will be many other side trips available. The Manufacturers' Division wishes to sponsor a reception as in past years and is leaving the decision up to the association board. The general outline of the program was approved by both boards. Sam Fowlkes of the New Orleans Convention Bureau said that the five-day limit on hotel rooms, which is still in force there, will be waived for this convention. Mardi-Gras will be over on the preceding Tuesday and conventioneers can be accommodated as early as Thursday of that week.

• Stanton Walker, N.S.G.A. director of engineering, and Alex Foster Jr. look a little chilled at the top of the ski lift.

The 1952 convention and exhibit will be held at the Stevens Hotel in Chicago during the week of February 23 or March 3, with the crushed stone convention also taking one of these dates. The 1953 convention in San Francisco has been tentatively scheduled for the week of February 22, but an effort may be made to get a later date. The 1954 location will be either Chicago or Cleveland. Invitations have been received to hold the 1955 meeting in Boston and Miami. The N.S.G.A. board approved an invitation to hold its 1951 midyear meeting in Washington, D. C., in the early Fall.

Vincent P. Ahearn, executive secretary, speaking before the joint meeting, gave a general picture of governmental actions already taken and expected in this national emergency. He declared that we are now on the outskirts of a military economy and that allocations and other restrictions may be expected at any time. He advised producers to get their plants in the best possible shape so that they would not be caught in the same position as in the last war, when they were expected to meet record war demands and could not get the necessary equipment and supplies to keep their plants going. He warned that there will probably be cutbacks in construction and pointed out that the actual dollar volume of construction is only slightly above the 1926-7 level, and that with higher unit prices the actual volume is considerably under that level. Mr. Ahearn predicted that there will be curtailment in the demand for aggregates and ready-mixed concrete in 1951 and that controls will probably go into effect soon after election day. He also predicted that price and salary controls will be tighter than the control on wages.

According to Mr. Ahearn, the manpower problem will be serious, due largely to the 3,000,000 men who will be called from industry into the service. The personnel requirements for the defense and rearmament program must also come out of civilian employment. He urged that producers look into their manpower requirements and be prepared to add women and handicapped persons in jobs which they can fill.

In discussing railroad car supply, Mr. Ahearn stated that the shortage is now the most critical in history, the supply of hopper and gondola cars alone being 16,000 cars per day less than requirements. He stated, however, that he believed that these industries are getting their fair share of the cars available. He also said that because of the shortage producers are now accepting cars they would ordinarily turn down, and that it costs an average of $5.00 per car to clean them. He predicted no relief in this situation in the next two years and suggested that with steel and labor shortages it might become worse.

Robert Mitchell (Consolidated Rock Products Co.) gave a brief summary of the Bureau of Mines sand-and-gravel safety contest report which had just been received. All three of the winning plants, he said, are represented on the board. In addition to the winners, there were 22 other plants which had no accidents, and 13 of these were also represented on the board of directors. All of these, he said, will be awarded certificates. A complete report of the results of this contest is presented in the news section of this issue.

Mr. Mitchell, at the N.S.G.A. board meeting, read a resolution extending the warmest congratulations of the association and its members to Fred Coppock, president of the American Aggregates Corporation, on the celebration of his 50th anniversary in the industry. Some details were given on how he got his start in 1900, when he opened a deposit

and loaded sand and gravel by hand, transporting it by wheelbarrow to railroad cars. Two years later he and an associate erected a simple plant, and in 1909 they built one of the first sand-and-gravel washing, crushing, and screening plants in the history of the industry. The resolution proposed that, in recognition of the many services Mr. Coppock has performed for the industry, he be elected an honorary member of the association. The resolution was enthusiastically and unanimously approved by the board, and Mr. Coppock now enjoys this distinction, along with Eric Ryberg and Nathan C. Rockwood.

There was some discussion of stream pollution. One producer told of his experiences, and advised that producers clean up their operations as much as possible and keep from discharging unnecessary quantities of material into streams and other bodies of water. He also urged them to keep local authorities and fish and game commissions informed of the steps they have taken, in order to avoid being blamed for pollution from other sources.

Stanton Walker, director of research, reported that things are going very well with the research program in the new laboratory. With reference to the coming annual convention, he said that operating problems should again receive their share of attention and urged that machinery manufacturers be encouraged to participate in these programs to a greater extent because their experience is much broader than that of most producers. The board indicated its willingness to have these men on the program if they are willing to participate.

With respect to the fire resistance of concrete, Mr. Walker commented on the differentiation in many codes between concrete with siliceous and calcareous aggregates. He said that new data on this subject is to be presented before the coming A.C.I. meeting in Washington.

Mr. Walker also commented on the proposed new A.S.T.M. specification for aggregates which is being written by a committee of which he is a member, along with A. T. Goldbeck of the National Crushed Stone Association, Fred Hubbard of the National Slag Association, and others. This group, he said, is writing a real specification which will go much farther than the present one. Mr. Walker added that the same three men are also on the A.C.I. committee which is writing a report on aggregate production.

Mr. Walker, at a special meeting for those particularly interested, gave an exhaustive report on the many laboratory investigations now under way and the progress made since the first of the year. These projects are too numerous and detailed to describe here; they include such subjects as studies of admixtures; freezing and thawing tests; concrete design procedure; absorption tests; field tests of air-entraining mixtures; thermal coefficients; the effect of fly ash on strength and resistance to freezing and thawing of concrete; and studies of lightweight aggregate concretes.

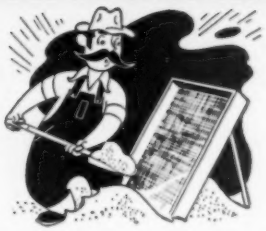
• In this group are (left to right, front row): W. E. Trauffer (Pit and Quarry); Mrs. Fred Bellamy and Harry D. Bellamy (Concrete Materials and Construction Co.); Mrs. W. J. Doyle Jr. (Tulsa Sand Co.); and Wayne W. King (W. S. Tyler Co.). Back row: Mr. and Mrs. R. F. Porter (Harry T. Campbell Sons Corp.); and Mr. and Mrs. J. R. Hill (Gifford Hill & Co.).

• Fred Bellamy getting a lesson on how not to take photographs from William J. Doyle Jr., who took some of the other photos in this article.

• Resting up after the ski lift ride—Mr. and Mrs. Richard K. Humphries (Pacific Coast Aggregates Corp.) and Mr. and Mrs. Herbert Jahncke (Jahncke Service).

The Interior Department offers for lease 80 acres of phosphate land in Bingham County, Idaho. Bids must be made to the Director, Bureau of Land Management, Washington, D. C., before November 22. Leases will be for 20 years.

Screenings



by William M. Avery

WE are adding to our extensive file of useless statistics a recent issue of *The Corporate Director*, a cozy little leaflet published by The American Institute of management, "expressly for its fellows," it says on the masthead. Hope the fellows won't be too upset if we give away a few of their trade secrets.

The issue we refer to contains a statistical study of the chief executives of 204 leading corporations, and in case you're grooming Junior for one of the plushier presidential jobs, there's really some food for thought in the survey findings. For example, if you insist on sending the lad to college, the study indicates that you'd better pick out Yale, which spawned 12 percent of the group, or Harvard, which claimed almost 9 percent. Or you can, with even more confidence, put him to work at delivering newspapers for four years, since 25 percent of the big wheels, constituting the largest single grouping in the list, reported "no college".

In commenting on the preponderance of Yale and Harvard men, the Institute notes that "in more than one case family intentions rather than educational qualifications have destined a man for high corporate office." This, we presume, is a polite way of saying that if the family controls enough shares of stock in the corporation, Junior can wind up in the driver's seat even if he flunks out in kindergarten.

Another matter to which you should give some serious thought is the precise section of the country in which your pride and joy first sees the light of day. A whopping 39 percent of the company presidents were born in the Midwest. If you've been careless about this little detail, don't despair; Junior has an almost equally good chance if he uttered his first wail in the Middle Atlantic states. If the stork overhauls you in any other section of the country, the odds are overwhelmingly against you.

The study also goes into the important matter of age groupings. This is useful information, because it will give you some notion of when, if ever, you may expect a return on your investment. Unfortunately the trail is a little muddy in this department, and the only thing we can tell you with certainty is that if your young hopeful doesn't make the grade by the time he's 90, there's very little hope. His best chances are between the ages of 50 and 59, although 15 percent of the present incumbents yelled bingo by the time they were 49.

Salaries and bonuses for the entire group averaged $119,065 per president, ranging from a high of over $598,000 down to a low of approximately $24,000. You will be relieved to know that there seems to be no traceable relationship between size of ultimate salary and place of birth or education. You'll just have to run the risk of seeing Junior eke out a miserable existence on a pittance of $24,000 a year.

Stall Story

FROM the St. Louis *Post-Dispatch:* "If you are hankering for a shower stall in the basement or outdoors, you can build a honey out of concrete blocks for just about nothing."

Mind you, now, we aren't hankering especially, but isn't there some way we could show just a teeny little old profit on the deal?

End of the Line

OUR "Hand That Cradles the Rock" item in the August issue prompted a reader to send us a clipping about another member of the "gentler" sex who drives a truck. This one hauls 10-ton loads of crushed stone for the Centropolis Crusher Co. of Kansas City, and fills in her idle moments in the role of housewife and mother of two children.

To a reporter of the Kansas City *Star* the 23-year-old mother revealed that her little girl has already expressed a desire to be a truck driver when she grows up. If this keeps up, the male of the species is inevitably going to lose his last slim claim to supremacy. The payoff will come on that fateful day when Pop hears Junior scream, "My Mom can lick your Mom!" at the kid next door.

Lo! The Poor Indian

UP at Aylmer, Quebec, they're having quite a to-do over a 2,000-cu. ft. rock, once used as an execution block by the Algonquin Indians, which is moving slowly toward the Ottawa River. Seems that a good many years ago an Indian named Strong Oak was dashed to death on the rock for some breach of tribal law. Before his death he predicted that his spirit would return and push the death rock into the river. He declared that when this little chore was completed, the

spirits of all dead Indians would be released to reclaim their heritage.

Any way, there seems to be some evidence that Strong Oak is trying to make good on his prediction, for the rock is now about 100 feet closer to the river than it was a century ago. The present rate of movement is about 14 inches a year, with approximately 1,200 feet still to go.

According to our calculations, if Strong Oak continues at his present rate, he'll make the grade sometime in the year 2978. Before he gives that last little shove, however, we hope he'll straighten up long enough to make a fair appraisal of what civilization has done to this fair land. We can just hear him saying, "Ugh! To hell with it!"

Lime Producers Discuss Industry's Problems at Sixth Operating Meeting

By WILLIAM M. AVERY

WELL over a hundred lime company officials and operating men attended the sixth operating meeting of the National Lime Association, held at the Nittany Lion Inn, State College, Pa., September 18 to 20. Formal papers and discussions during the three-day gathering dealt with such diverse subjects as lime production developments overseas, pneumatic conveyors for pulverized and granular materials, a study of lime refractories, operating experience with preheaters, lime calcination research, and palletized shipments. One entire day was given over to an inspection tour of plants of The Warner Company and The National Gypsum Company at nearby Bellefonte, Pa. The Bellefonte tour was of particular interest because it provided the first opportunity for many of the visitors to study underground mining operations in the lime industry. Following the plant tour the entire party drove to a nearby mountain lodge for an excellent group dinner as guests of the association.

Overseas Developments *Lime Production Methods in Europe, Palestine and Latin America* was the subjects of an illustrated presentation by Victor J. Azbe, Azbe Corp., St. Louis. Although lime is in ever increasing demand in foreign lands, the speaker said that methods of manufacture are still rather primitive by American standards. Despite steadily rising labor and material costs, most overseas production is in intermittent kiln. One result of this, Mr. Azbe said, is a tremendous demand for American know-how.

Using excellent lantern slides to illustrate his remarks, Mr. Azbe took the audience on a picture tour of lime plants in foreign countries. In many countries, he pointed out, fuel is critical, and there is a demand for kilns that are suitable for firing with several different types of fuel.

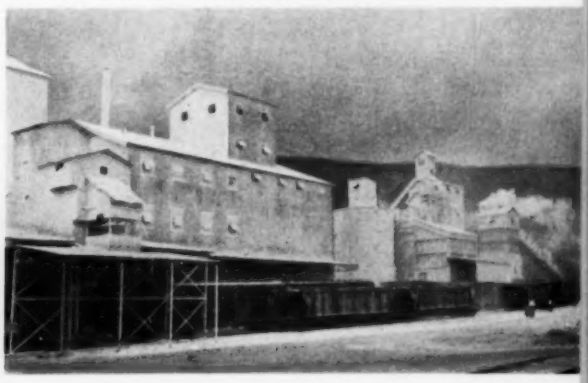
In Brazil, Mr. Azbe said, there are chronic shortages of both cement and lime needed to keep pace with the country's rapid development. Since labor is very cheap, there is little incentive to mechanize, but fuel presents serious problems. Many kilns are fired with wood. Eucalyptus trees are grown and harvested at 6-year intervals to provide kiln fuel. It requires about a ton of wood, at a cost of approximately $6.50, to produce a ton of lime.

In Argentina, where the shortage of fuel is even more acute, a harvest of eucalyptus trees takes close to half a century. Wood for fuel costs about $9.00 a ton, and it takes about 1.3 tons to produce a ton of lime. Labor costs, Mr. Azbe said, are also much higher than in Brazil, and the increase has been imposed so suddenly that the lime industry has had no opportunity to make adjustments. As an example he mentioned a plant which employs 700 men for a nominal output. An inevitable result of such poor labor efficiency, coupled with a tremendous rise in wages, is that the selling price of lime has gone sky high, with the material selling for as much as $25 per ton in bulk at the plants.

• Arthur C. Hewitt, co-chairman of the arrangements committee for the N.L.A. meeting, and Bolton L. Corson, who presided at one of the sessions.

Pneumatic Conveyors Col. George K. Engelhart of the Fuller Company, Catasauqua, Pa., presented an excellent paper on the use of pneumatic conveyors for handling pulverized and granular materials. For the lime industry and its customers, the speaker said, practical applications of pneumatic conveying are limited to the handling of hydrated, caustic, and pebble lime; flue and collector dusts; pulverized coal; and limestone pulverized to a fineness of at least 50 percent minus 200-mesh, the latter

• A general view of the Bellefonte plant of The Warner Company, one of the two plants covered in the inspection tour made in connection with the meeting at nearby State College, Pa.



• National Gypsum's lime plant, also located near Bellefonte, shared honors with The Warner Company's plant during an all-day tour of inspection.

• Left: M. A. Rikard, Southern Cement Co., Birmingham, Ala., and Casper Arndt and E. D. Williams Jr., both of H. E. Millard Lime & Stone Co., Annville, Pa.

• Right: D. H. Shearer, National Gypsum Co., Buffalo, and K. L. Hammond, Keystone Lime Works, Inc., Keystone, Ala.

material including limestone filler dusts, rock dust, and fine agricultural limestone, but excluding coarsely ground agricultural limestone.

Pneumatic conveyors, Col. Englehart said, comprise five types, each differing in design and method of operation, and each having a distinct field of use. So that references to the limitations of the various types for specific uses would not be construed as criticism of competitive equipment, he confined detailed discussions to units manufactured by the Fuller Company.

For the four types of conveyors which transport materials through pipe line systems, the speaker listed the following advantages as compared with mechanical handling: elimination of the necessity of straight-line conveying, thus gaining considerable freedom in conveyor and plant equipment layout in new plant designs; in existing plants, permitting modernization and equipment additions without reference to conveying problems; the ability to convey materials far beyond the practical limits of mechanical conveyors; the elimination of dust nuisance, dust hazard, and mechanical hazard; the ability of a single system to deliver material to an almost limitless number of points; low maintenance costs.

For short conveying distances or elevations, the speaker said, mechanical conveyors have an advantage in initial cost. This advantage decreases, or disappears, as conveying distances or elevations are increased, or when several changes in direction are required, or when multiple delivery points must be served.

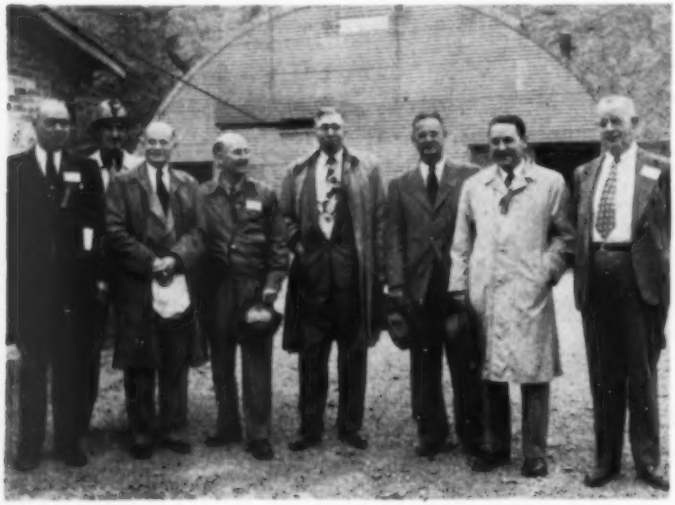
The term "pneumatic conveyor," Col. Engelhart said, is most commonly applied to the type of conveyor in which the material moves in suspension in air, moving at high velocity induced either by vacuum or pressure, or by a combination of both. The Fuller Airveyor, an example of this type, is essentially a king-sized vacuum cleaner with the addition of a continuous, automatic dust filter, which is exhausted by means of a positive pressure blower. The conveying line opens tangentially into the cyclone section of the filter, and the bulk of the material is separated from the air and falls to the bottom of the cone, from which it is discharged by a rotary airlock feeder. A number of lantern slides were presented to show applications of the Airveyor.

Other types of pneumatic conveyors, the speaker said, are limited in use to the handling of dry pulverized materials which can be fluidized when properly aerated, usually meaning a fineness of at least 50 percent minus 200-mesh. Examples of easily fluidized materials are hydrated lime and pulverized coal, while coarsely ground agricultural limestone is typical of the opposite extreme.

According to the speaker, the Fuller-Kinyon System is the most important conveyor in this group, relative to the number of installations and the tonnages handled. More than 100 installations serve the lime industry for conveying hydrated lime and pulverized limestone, including agricultural limestone. A few are handling caustic lime. Such systems are capable of transporting materials over relatively long distances and are readily operated under automatic and remote control. The system comprises a motor-driven, screw-type pump, preferably driven by a rotary air compressor. The unique features of the pump are its ability to form a continuous seal of the material itself, to maintain a maximum material-to-air saturation, and to maintain a constant line pressure for any given operating condition. Both stationary and portable models are made in nine standard sizes, with capacities ranging from 3 to 100 tons of hydrated, or up to 250 tons of pulverized limestone per hour.

The Fuller-Fluxo pump was described by Col. Englehart as representing the third type of pneumatic conveyor. It consists of a pressure vessel to which material is admitted by gravity under the control of a cone valve. When the material reaches a certain level, compressed air is admitted through an aerating ring at the spring line of a bottom cone, and additional air is admitted through an entry valve at the bottom. The material discharges

• One of the groups of visitors at the Bell mine of The Warner Company.



through an inclined tubular outlet when the pressure is sufficient to overcome the static resistance of the pipe line system. Thus single-tank systems operate intermittently, the cycle being repeated automatically when the pressure drops to a predetermined minimum. When the feed of material is continuous, duplicate tanks are used, and automatic controls alternate the filling and discharge cycles. This pump is especially well adapted to extremely long conveying distances, *i.e.* in excess of 2,000 or 3,000 ft., which is the practical limit of the Fuller-Kinyon pump.

The fourth type of pneumatic conveyor was described as a special-purpose elevator, used for blending pulverized materials and for constant-weight feeding. In the application shown in one of the slides, it was part of a constant-head feeder for delivering pulverized limestone to a rotary kiln at a constant rate, the material being elevated through a 6-in. pipe, having a flared intake above a porous block, through which air is admitted at sufficient pressure to fluidize the material. The vertical pipe discharges into an overflow feeder box which maintains a one-ft. head of uniformly aerated material above a feed screw.

In referring to the F-H Airslide as the fifth type, Col. Englehart pointed out that it is not, strictly speaking, a pneumatic conveyor, but rather one in which a material fluidized by aeration flows by gravity down a relatively flat incline. An enclosed type consists of a trough-like air chamber with a porous upper surface, enclosed by an inverted trough which forms the material conveying channel. The porous surface, usually of canvas, is the equivalent of 6- to 8-ply power-transmission belting, so woven as to have a uniform, but relatively high, resistance to air flow.

• Paul LaLiberte, Cutler-Magner Co., Duluth, who presented one of the papers at the three-day meeting.

The required angle of inclination of Airslides varies with the fluidity of the material, ranging from 4 deg. for free-flowing materials, to as much as 8 deg. for very fine materials, which tend to agglomerate on a relatively flat surface, or for such coarsely ground materials as agricultural limestone. Air requirements and aerated angles of repose for various materials are usually determined on test equipment. For the enclosed type fans are used as the source of air.

In open type Airslides used for discharging bins, air is supplied by positive pressure blowers. Materials up to 300 deg. F. can be handled safely on the fabric type. For higher temperatures up to 1,200 deg. F. porous plates of ceramically-bonded aluminum oxide are substituted for the canvas.

Of some 40,000 ft. of Airslides installed to date, Col. Englehart said, there are only ten installations in service in the lime industry, handling hydrated lime, hydrated lime dust, filler dust, and agricultural limestone. Numerous specimens of pulverized limestone, magnesite, and whiting have been handled experimentally.

Using lantern slides to illustrate his points, the speaker discussed the various operating features of Airslides. Such conveyors are readily able to pass around corners, and they may be started and stopped under full load. Their capacity, not yet fully determined, is relatively enormous. One installation, 12 in. wide and 120 ft. long, is conveying pulverized limestone at the rate of 250 t.p.h., the total air requirement being supplied by a 5-hp. fan. Power requirement for a given length and capacity is between ⅛ and 1/10 the power required for a screw conveyor.

Since Airslides have been in continuous service for only about three years, there is little information available on maintenance requirements. Costs are expected to be extremely low, however.

Lime Refractories An able discussion of rotary kiln refractories was presented by R. W. McAllister of Arthur D. Little, Inc., Cambridge, Mass. Defining an ideal refractory as one which conserves the maximum amount of heat and yet requires minimum maintenance and replacement, Mr. McAllister noted that some operators prefer long life without regard to heat conservation.

Although this point of view is understandable, he said, the saving in fuel possible with insulating refractories should not be overlooked. According to the speaker, the heat loss from the shell of a 10- by 200-ft. ro-

• Left: J. A. Dunaway, Peery Lime Co., North Tazewell, Va.; A. H. Nieman, Ohio Hydrate & Supply Co., Woodville, O.; and Charles E. Rarey, Marble Cliff Quarries Co., Columbus, O.

• Below: C. C. Loomis, Louis Bongiolatti Jr., and W. J. Barrett, all of the New England Lime Co., Adams, Mass.

tary kiln lined with conventional refractories may be 10 million B.t.u's per hr., representing the consumption of about 10 tons of coal per day solely to make up this loss. It is probable, he went on, 50 to 75 percent of this heat could be preserved by the use of more insulating refractories. For the purpose of his discussion Mr. McAllister considered the first fourth of the kiln a preheating zone, the next two fourths a calcining zone, and the last fourth a flame or high-temperature zone. In the preheating zone resistance to abrasion is a major requirement, since a soft refractory can be worn through in a single day. Although Duro brick are widely used in this zone, and have proved reasonably satisfactory, Mr. McAllister believes that improvement is possible, particularly with respect to abrasion resistance. Tests carried out several years ago, he stated, indicate that paving bricks have as much as 25 percent greater resistance to abrasion.

In the calcining zone, according to the speaker, the common practice is to use fireclay refractories, prepared by drip and wet process procedures, with 6-in. block used to greater extent than 9-in. Life of refractories in this zone runs to and beyond ten years.

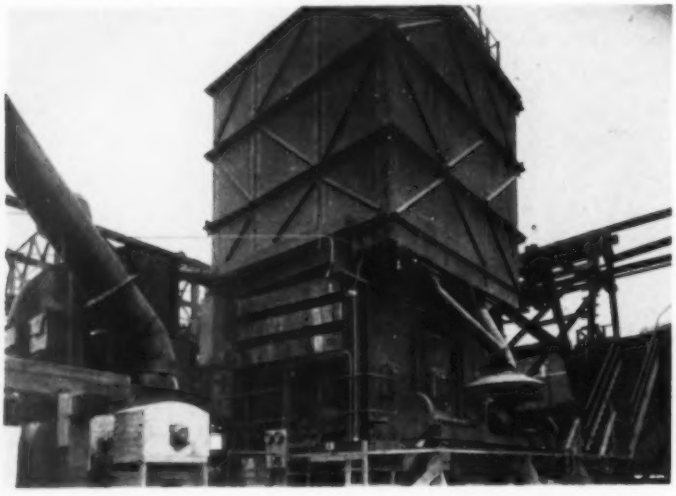
The most common insulating procedure has been to line the kiln shell with a highly insulating block, such as Superex, and then lay 6-in. fireclay refractories against the Superex, using 9-in. block directly against the shell at intervals to reduce slippage. One objection frequently advanced against this method is that the wear of the soft insulating block in contact with the harder refractory brick, causing the latter to loosen and fall out, results in high maintenance costs. A refractory which Mr. McAllister believes should be thoroughly tested is a cross between an insulating block and a refractory block. A 2-ft. section of such insulating firebrick installed in the hot zone of an oil-fired kiln lasted about five years. The refractory used had a cold crushing strength above 500 p.s.i., and a K value of 3.5 at 200 deg. F. Such block are identified as A-30, and are made on special order by Armstrong Cork Co.

If blocks of this type prove insufficiently resistant to abrasion, the speaker suggests the use of aluminum phosphate, made into a paste with grain alumina, as a surface coating. He added that it should be possible to replace this wearing surface by recoating at intervals.

It is in the burning zone, according to Mr. McAllister, that refractory linings cause the most trouble. He believes that the insulating refractory described above has possibilities for use in the burning zones of gas- and oil-fired kilns. For coal-fired kilns he suggested the use of 6-in. 70-percent alumina refractory block laid on top of a high-strength insulating firebrick laid on its side.

The speaker also discussed the possibilities of metal alloys suitable for both the high temperatures and the abrasion encountered in lime kilns. Some extension of the idea of using alternate layers of metal and insulating material might find value in rotary kilns, Mr. McAllister said.

• A view of the preheater installation at the Duluth plant of Cutler-Magner Co., the subject of one of the papers presented.



Preheating In the panel discussion on the Kennedy-Van Saun preheater, the first speaker was Paul LaLiberte of Cutler-Magner Company, Duluth, Minn. The first limestone preheater of the Kennedy-Van Saun design was installed in 1939, at the time Cutler-Magner's Duluth lime plant was converted to a rotary kiln operation.

Since there is no limestone at the head of the Great Lakes, Mr. LaLiberte explained, his company must stockpile sufficient stone during the navigation season to take care of winter requirements. Thus several factors favored the use of a preheater, such as the availability of uniform-size washed stone, the need for handling and feeding frozen chunks of stone to the kiln, and the need for conserving the limited space available for stone storage. High fuel costs also introduced an economy factor which favored the use of a preheater.

The function of the limestone preheater is not complicated, Mr. LaLiberte said. A stone storage bin directly above the preheater has a capacity of approximately 250 tons. The stone moves by gravity from this bin into the preheater. Moisture is removed from the stone as it passes over a series of grates in the lower section of the storage bin. This is done by means of a moisture duct connected to the kiln gas exhauster fan, the temperature of the air and stone at this point being beween 120 and 150 deg. F. Part of the heat passing from the kiln into the preheater rises through the bin, so that the stone, as it enters the preheater, is relatively dry, and there is no trouble due to frozen chunks during the winter months.

The preheater, Mr. LaLiberte continued, consists of a series of grates at five levels, staggered so as to encourage uniform distribution of the gases throughout the preheater. Opposite the upper three levels of grates there are outlet gas ducts by means of which the height of the stone bed through which the gases pass may be regulated.

The actual feeding to the kiln is done by plunger feeders, there being eight of these feeding through six step-type spouts. The feeder stroke ranges from 1¼ to 1½ in. Since the pockets of the spouts remain full of stone, the feed actually passes over a bed of stone. According to Mr. LaLiberte the spouts have not been replaced or repaired in the 10½ years they have been in service. The six spouts converge to an alloy kiln feed spout which directs the preheated stone into the kiln.

At the hottest point in the preheater the stone reaches a temperature of about 1,500 deg. F., but there is some cooling beyond this point, and the temperature averages about 1,250 deg. F. as the stone enters the kiln. The tests indicate that there is a surface calcination of 3 to 7 percent of calcium oxide as the stone leaves the preheater.

The preheater operates best, the speaker said, when a portion of the kiln exit gases (from 10 to 30 percent, depending on production level) is by-passed. Exit gas temperatures average 1,500 to 1,600 deg. F. from the kiln, and 300 to 400 deg. F. from the preheater. The stone is retained in the preheater approximately two hours.

Apart from the cost of design changes made in the first few months of operation, Mr. LaLiberte said, maintenance costs on the preheater, consisting primarily of duct and grate replacements and repairs, have averaged about five cents per ton of lime. He listed the following benefits derived from the installation:

1) Improved kiln efficiency, with estimated savings, determined by comparing operations with and without the preheater, of about 20 percent.

2) Increased kiln capacity.

3) Improvement in the quality of lime as a result of more uniform kiln temperatures.

4) Improved kiln control.

5) An unlooked-for advantage resulting from the fact that the preheater serves to some extent as a dust collector. Based on the stone feed, from 1½ to 2 percent of dust is recovered in the preheater.

6) Lower kiln temperatures resulting in longer service from linings; hot zone liners now last about two years.

7) Removal of moisture from the kiln feed, a particularly important consideration when feeding stone from open storage piles in severe winter weather.

The next speaker on the panel discussion was John Gaisford, Lee Lime Corporation, Lee, Mass. Mr. Gaisford described an installation of the Kennedy-Van Saun preheater made at his company's plant just over three years ago. In this installation the stone is first screened and sized, and then is fed into a 100-ton stone hopper, from which it falls by gravity into the preheater proper. A large fan draws exhaust gases from the kiln through the stone, heating it to more than 1,000 deg. F. Adjustable feeder bars located under the grates feed the preheated stone into a hopper, from which it passes down a feed pipe into the kiln.

The Lee installation, Mr. Gaisford said, included a deheater, consisting of a soaking pit on top where the lime is finished off, below that the deheater proper where the lime is cooled, then the grates through which the cooling air is forced, and finally a system of feeder bars, similar to those used in the preheater, to take the lime out.

Mr. Gaisford described in considerable detail some of the early difficulties experienced with dust in connection with the preheater operation. This problem was helped by the installation of grates of a different pattern, and seems now to have been quite eliminated by the simple expedient of reducing the kiln speed.

At an initial speed of one revolution in 75 seconds, the kiln burned 16 tons of coal to produce 60 tons of lime, giving a fuel ratio of 3.75 to 1. At the present speed of 125 seconds per revolution, 18 tons of the same coal produce 100 tons of lime at a fuel ratio of 5.5 to 1. The quality of the lime, Mr. Gaisford said, has improved considerably.

A general discussion of the subject of heat efficiency was presented by Irving Warner, vice-president of The Warner Company, Philadelphia. Mr. Warner, using a series of theoretical calculations, showed the important results that can be obtained by conserving heat at various points in lime burning circuits.

Lime Research J. A. Murray, associate professor of Materials at Massachusetts Institute of Technology, told about some of the interesting work being done on fundamental lime calcination research. One project he described in considerable detail involved the differential thermal analysis of samples of stone supplied by various members of the National Lime Association. These stones were placed in a differential thermal analyzer and heated at a uniform rate of 10 deg. C. per minute for about two hours, or long enough to bring about calcination. The impurities present were identified by measuring the temperature difference between the limestone and the inert materials in each sample. The characteristics of Ohio dolomites were found in these tests to differ very sharply from non-Ohio dolomites.

When the non-Ohio dolomites were soaked in a one-percent solution of sodium chloride, the curve for these stones was found to approximate very closely the curve for Ohio dolomites; *i.e.*, the treated samples began to decompose at around 450 deg. C., instead of at about 750 deg. C. for the same materials before they were treated.

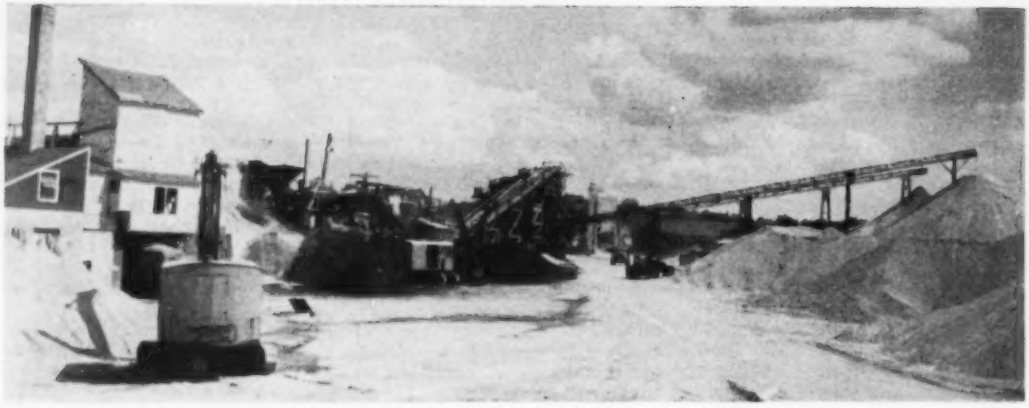
To determine whether this effect was a result of the sodium or the chloride, in succeeding tests sodium carbonate and calcium chloride were used in place of sodium chloride. These substitute materials were found to be just about as effective as sodium chloride in causing limestone to break down at lower temperatures, indicating that the sodium and the chloride are both effective in about the same degree. When the same tests were carried out with sulphates of sodium magnesium and aluminum, it was found that these materials seemed to inhibit the action.

When similar tests were carried out on high-calcium limestones, the curve for temperature of decomposition was affected very little, but on magnesium limestones there was a marked reduction of the temperature of decomposition of the magnesium carbonate.

Questioned as to the method used in treating the samples, Professor Murray said that dry stone was soaked over night in a one-percent sodium chloride solution.

Palletized Shipments David Cessna of the Towmotor Company, Cleveland, addressed the meeting briefly on some of the economies that may be gained through the use of fork trucks to handle bagged materials. He mentioned the vast improvement in fork truck design, and the many auxiliary attachments now available to solve a wide range of materials-handling problems. Towmotor fork lift trucks, Mr. Cessna said, are now available in capacities ranging from 1,500 to 15,000 lbs. Many of the varied applications of Towmotor lift trucks were shown in an excellent sound-color movie appropriately entitled "The One-Man Gang."

The chairman of the operating division of N.L.A. is L. N. Carinouche, of the Dow Chemical Company, Ludington, Mich. The program chairman for the 1950 meeting was William J. Ash of the New England Lime Company, Canaan, Conn. Arthur C. Hewitt of The Warner Co., and Harold Gustafson of the National Gypsum Company, composed the arrangements committee. John V. Andrews, of the Kelley Island Lime & Transport Company, Cleveland, was unanimously elected program chairman for the 1951 operating meeting.



• A general view of the yard and plant of the Rosenfeld Washed Sand & Stone Company at Milford, Mass. The building at the far left houses the bins and batching equipment for the company's extensive ready-mixed concrete operations.

New England Aggregate Firm Builds Varied Business on Service

By WILLIAM M. AVERY

another ON THE SPOT report

IN our calls on plant operators throughout the country conversation almost inevitably gravitates toward problems and practices concerned with production. Market development, sales promotion, customer service, and related problems usually enter the discussion only when we drag them in, and despite our best efforts and intentions we usually leave with very little specific information concerning these subjects.

This is not always the case, however, and occasionally we have even had the pleasant experience of talking to producers who are quite willing to discuss their sales practices. We had this enjoyable experience several months ago when we called on Joseph Rosenfeld and Saul Kraft, respectively president and sales manager of the Rosenfeld Washed Sand & Stone Company at Milford, Mass. These gentlemen are understandably proud of the outstanding job which their organization has done in developing markets through the medium of customer service, and their experience strongly suggests that the entire industry could do far more along this line than is now being attempted.

The Rosenfeld company was organized in 1922 by Abraham Rosenfeld, father of the present owner, to supply sand and gravel for a filtration plant at Milford. After a brief period of loading and screening by hand methods, power loaders and a portable screening plant were purchased. By 1931 the original deposit was exhausted, and in that year the present head of the company purchased an excellent 200-acre farm site on the outskirts of Milford. In addition to extensive reserves of sand and gravel, the new property included a trap rock quarry. Quarry operations were carried on long enough to give the company its present name, but in recent years only the sand and gravel deposits have been worked.

• Left to right: Joseph Rosenfeld, president; Saul Kraft, sales manager; Harry Rosenfeld, plant manager; and John Casey and Benjamin Green, in charge of the office. The truck in the background has been in service since 1938, an eloquent testimonial to the effectiveness of the company's maintenance program.

In 1932 a small washing and screening plant was built on the property, to become the nucleus of large-scale facilities which today are capable of processing up to 1,000 cu. yds. of material in a 10-hr. day. The company's opening gambit as a service organization dates from 1938, when ready-mixed concrete operations were initiated with two transit-mix trucks and an Erie Aggremeter batching plant.

At the outset the concrete business was regarded simply as a means of stabilizing somewhat the demand for sand and gravel by providing for the latter materials an outlet over which the company had some measure of control. As the popularity of ready-mixed-concrete service grew, however, this phase of the business was seen as a prime means of developing a far larger market for

• A view of the 500-bbl. bulk cement plant from which cement is weigh-batched to the truck mixers.

• One of the fleet of 20 truck mixers loading aggregates at the Milford batching plant.

aggregates than had been thought to exist in the Milford area.

This problem was approached on the basis of capitalizing to the maximum extent on the convenience and availability of ready-mixed concrete. It was decided, for example, to make available a complete service for the construction of concrete foundations for residences. Two 5-man crews were employed, trained, and equipped to do all the varied jobs required in work of this type, from making the initial survey and digging the cellar, to stripping the forms and backfilling. The use of steel forms, and effective planning of each stage of the work make possible important savings in both time and costs, with the result that home builders find it greatly to their advantage to utilize the service.

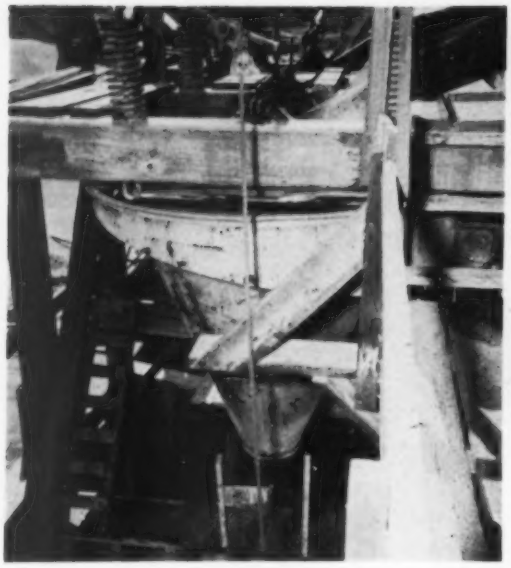
An average home foundation job is completed within a week after ground is broken. In many instances the customer may have sufficient funds for the purchase of the lot and the construction of a foundation. By utilizing the Rosenfeld service he not only gets his building project off to a quick, economical start, but the way is smoothed for borrowing funds with which to complete the work. With an average of a hundred such jobs per year, the company has developed a steady market for approximately 5,000 cu. yds. of ready-mixed concrete placed by its own crews.

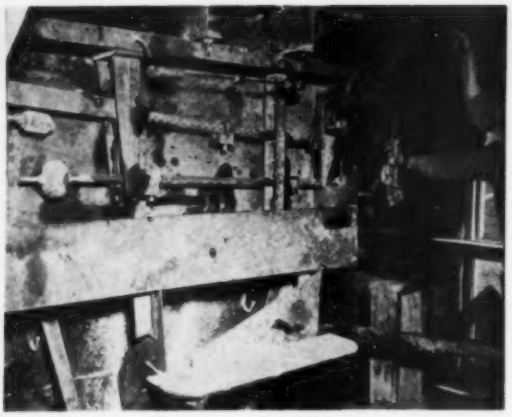
A similar service, utilizing the same crews, is provided for home-builders who want concrete floors, and this type of work shows equal promise of developing into a steady, dependable market for ready-mixed concrete. The company has steadfastly refused to branch out into other types of concrete work, since it has no desire to compete with its own customers in the general contracting field.

By such alert methods as these Rosenfeld has built up its concrete business to about 50,000 cu. yds. per year, this volume being about equally divided between the plant at Milford and a more recent batching installation located at Ashland, Mass., about 12 miles north of Milford. Facilities at Ashland include a 3-compartment 150-ton Erie Aggremeter and a 500-bbl. Johnson bulk cement bin located on a railroad siding. Both plants are equipped with steam generating equipment for heating the

• Materials are loaded into dump trucks at the pit face with this ¾-cu. yd. diesel-powered shovel.

• One of the twin-screw sand washers used to recover concrete sand.





• A view of the 2-cu. yd. batcher used in transit mixed-concrete operations. This unit will shortly be replaced by a 5-cu. yd. batcher of the same type and make to expedite the loading of truck mixers.

• Left: Very fine sand, marketed for use in asphalt shingles and tar paper, is recovered from waste water by means of two cone classifiers.

bins, as well as separate boilers to provide hot water for winter operations. The mixer fleet is now comprised of 20 units ranging from 3 to 5 cu. yds. in capacity, all but three of which are of the high-discharge type.

The Rosenfeld property now includes about 500 acres of land, a large part of which contains an excellent grade of glacial sand and gravel. Overburden, consisting of 1½ to 2 ft. of rich top soil, is stripped with an Allis-Chalmers HD-14 bulldozer and loaded into trucks for delivery to greenhouses.

After the stripping is completed, material is dug from the 20-ft. banks with a Northwest Model 25 ¾-cu. yd. diesel-powered shovel. Three Sterling end-dump trucks, ranging from 7 to 11 tons in capacity, haul the material to the processing plant. The length of haul varies somewhat from day to day, but the maximum at present is about 1,000 ft.

The trucks are dumped from a high ramp into a steel hopper mounted over a reciprocating feeder. Plus 1½-in. material is discharged by a trommel directly into a 14 by 28-in. New England Road Machinery jaw crusher, while the minus material by-passes the crusher. The two lines of flow are rejoined on a 20-in. inclined belt conveyor which discharges at the top of the plant into a 48-in. rotary screen.

Water is introduced at the screen at the rate of 900 g.p.m. to thoroughly wash the material. Sands are recovered by means of two twin-screw sand washers, which retain concrete sand, and two Kennedy-Van Saun classifiers, which recover a very fine grade of sand from the waste water. The latter material is used by manufacturers of asphalt shingles and tar paper.

The truck loading bins on which these facilities are mounted have a total capacity of 500 tons in 7 compartments. These are used entirely for various sizes of coarse material, including two sizes of pea gravel, ¼ to ½-in. roofing gravel, and crushed or semi-crushed material in size ranges of ½ to ⅝-in., ¾ to 1-in., and 1¼ to 1½-in. The circuit also includes an Allis-Chalmers No. 3 reduction crusher in which plus ¾-in. stone from the screen can be recrushed to increase the proportion of the smaller sizes produced.

Concrete sand and concrete brick sand are stockpiled directly from the plant by means of two 20-in. inclined belt conveyors, one 250 ft. long and the other about 275 ft. long. Other materials are stockpiled by loading from the bins into dump trucks. Six Northwest shovels, three Ensleys, and one Link-Belt Speeder are available for reclaiming materials from the various stockpiles.

The batching plant for concrete operations at Milford is located against a high bank adjacent to the stockpile area. Company trucks are thus able to discharge aggregate from a roadway directly into the storage bins above the batcher. Currently batching is done with a 2-cu. yd. Erie Aggremeter, but a 5-cu. yd. batcher of the same make is slated for early installation to speed up the loading of truck mixers. Cement is batched to the trucks from a separate 500-bbl. single-compartment Johnson bulk cement plant. Dispensing devices are available for the addition of Pozzolith or Darex to the mixes whenever these materials are specified by the purchaser. Both batching plants are equipped with steam generators for heating the bins during winter operations, as well as with separate boilers for heating water.

The plant buildings at Milford include extensive maintenance shops which are equipped to carry out almost every conceivable type of repair job on company equipment. The plant is particularly notable for the excellent appearance of its truck fleet, which includes 25 dump trucks used for delivering bulk materials. These are not only kept in top-notch mechanical condition, but are repainted at frequent intervals so that their appearance on the streets of Milford and the nearby highways will reflect credit on the entire organization.

Including mechanics, welders and others employed in maintenance work, the Rosenfeld organization numbers about 65 men. The extremely varied nature of the company's operations is indicated by the fact that only 7 men out of this large total force are directly engaged in the production of sand and gravel. The company's ready-mixed-concrete operations at Milford and Ashland normally consume about half the total output of sand and gravel.

Effect of Blast Furnace Slag Cement on Alkali Aggregate Reaction in Concrete*

By Herbert P. Cox, Robert B. Coleman Jr. and Locke White Jr.

Introduction

SINCE the discovery in 1940 of the alkali-aggregate reaction in concrete and the cracking and distress caused by the reaction, much work has been done to determine the mechanics of the reaction and how to prevent it. Present information indicates that it can be prevented by using a portland cement with a total alkali content below 0.6 percent or by using a non-reactive aggregate[1]. Incorporating a large amount of amorphous silica in a potentially reactive mortar has been shown to render it safe for use[2]. A wide variety of pozzolans, when used as replacement for part of the portland cement in a reactive mixture, will reduce or prevent entirely the alkali-aggregate deterioration. Typical examples are fly ash, certain pumicites, and calcined clays and shales.

Similarities of structure and composition between blast-furnace slag and these beneficial pozzolans suggest strongly that blast-furnace slag cements should similarly inhibit the alkali-aggregate reaction. However, many users of concrete have overlooked this positive advantage of blast-furnace slag cement and have chosen instead to avoid the use of slag cement because of its high alkali content, fearing that the slag cement will actually aggravate the alkali-aggregate reaction. The present study was undertaken in order to provide an objective appraisal of the effect of blast-furnace slag cement on the alkali-aggregate reaction.

Properties of Blast-Furnace Slag Cement

Run-of-the-mill blast-furnace slag cement used in this work was composed primarily of finely ground, water-quenched, blast-furnace slag. Concrete in which all or part of the portland had been replaced with blast-furnace slag cement had the usual longer setting time and lower early strength, when compared with concrete containing straight portland cement; however, concrete containing a blend of 25 percent slag cement to 75 percent portland cement, or 33 1/3 percent slag cement to 66 2/3 percent portland cement, shows higher strengths on tests after the period of from 60 to 90 days, when compared with concrete made from straight portland cement only. The granulated slag in this cement contained from 35 to 40 percent SiO_2, 45 to 50 percent CaO, 12 to 16 percent R_2O_3, 0.5 to 2 percent alkali, and 1 to 2 percent MgO. Rapid cooling of the slag from the blast furnace favored the formation of a maximum amount of glass.

Mortar-Bar Tests of Expansion

The most widely accepted laboratory procedure for detecting alkali-aggregate reaction is the expansion of mortar bars. The first measure of the effect of slag cement on the reaction was obtained from the expansions of a series of mortar bars in which slag cement had been substituted for all or a part of the portland cement. All aggregates used had been shown to be reactive by Mielenz's chemical test. All portland cements used were Type I; their alkali contents ranged from 0.16 to 1.43 percent. The procedure for preparing, storing, and measuring the bars was that described by Mielenz and Witte[3].

The comparisons between bars in which all of the portland cement was replaced with a slag cement[4] are shown in Table I. It is evident that slag cement produces less expansive reaction than portland cement.

Since slag cement is usually used only with portland cement for concrete, it is of more significance to consider the bars involving partial replacement of portland by slag cement. The data for those bars are shown in Table II. Because none of the portland cements conveniently available in the Southeast had excessively high alkali contents, portland cements were enriched with K_2CO_3 up to the total alkali contents indicated in the table.

Table I
Per Cent Expansions after Six Months of Mortar Bars Made from Slag or Portland Cements

Cement	Per-cent Alkali as Na_2O	Aggregate A	B	C	D
Slag 1	1.39	-0.027	0.009	-0.008	0.000
Portland 3	0.66	0.035	0.040	0.025	0.025
Portland 4	0.60	0.018	0.019	0.013	0.019
Portland 7	0.16	0.002	-0.002	0.001	0.006

Per Cent Expansions after Nine Months of Mortar Bars Made from Slag or Portland Cements

Cement	Per-cent Alkali as Na_2O	Aggregate A	B	C	D
Slag 1	1.39	-0.016	-.015	-.009	-.001
Portland 3	0.66	0.045	0.054	0.028	0.033
Portland 4	0.60	0.024	0.024	0.016	0.024
Portland 7	0.16	0.000	0.004	0.002	0.007

The results show that the slag cement nearly always inhibits alkali-aggregate expansion. In no case is the magnitude of the expansion as great as would be expected if the alkali in the slag cement were actually aggravating the reaction.

Expansive Reaction Reduction Test

As another measure of the effect of blast-furnace slag cement on the alkali-aggregate reaction, the reduction of expansive reaction by slag cement was tested by the procedure outlined in the Bureau of Reclamation's *Specification for a Pozzolan, No. 2835.* Briefly, this test calls for comparing the expansion after 14 days under controlled storage conditions of three reference mortar bars composed of high-alkali Type II portland cement and pyrexglass aggregate with three test bars in which one-fourth of the absolute volume of the Type II cement has been replaced with a like volume of a pozzolan. Two Type I portland cements with a medium and low alkali

*The work reported here was performed at Southern Research Institute as a part of a project for the Southern Cement Company.

[1]Blanks, R. F., and Meissner, H. S., "The Expansion Test as a Measure of Alkali-Aggregate Reaction," *J. Am. Concrete Inst.*, Vol. 17, 536 (1946).

[2]Kelly, T. M., Schuman, W., and Hornibrook, F. B., "A Study of Alkali-Aggregate Reactivity by Means of Mortar Bar Expansion," *J. Am. Concrete Inst.*, 20, 63 (1948).

[3]Mielenz and Witte, *Proc. A.S.T.M.*, 48, 1097 (1948).

[4]Slag cement 11 is Southern Cement Company's Magnolia. Slag cements 1 and 2 are the same except for differences in additives which are not thought to affect the alkali-aggregate reaction very significantly.

Table II
Monthly Expansions of Mortar Bars Made from Combinations of Portland and Slag Cements

Slag Cement	Portland Cement	Percent Alkali as Na_2O	Aggregate	Fraction Slag Cement	Percent Expansion at Monthly Intervals											
					1	2	3	4	5	6	7	8	9	10	11	12
II	3	0.66	C	0	0.010	0.014	0.015	0.022	0.024	0.026	0.028	0.028	0.028	0.028	0.028	0.028
				1/4	0.003	0.008	0.007	0.007	0.006	0.008	0.001	0.008	0.008	-0.001	0.008	0.014
				1/2	0.002	0.003	0.003	0.003	0.011	0.011	0.000	0.006	0.005	0.003	0.006	0.013
				1	0.003	0.005	0.003	0.000	0.004	0.006	-0.011	-0.003	-0.004	0.000	0.000	0.005
II	3	0.66	E	0	0.003	0.014	0.020	0.023	0.025	0.027	0.028	0.030	0.031	0.032	0.035	0.035
				1/4	0.030	0.023	0.026	0.030	0.034	0.031	0.032	0.032	0.031	0.032	0.032	0.031
				1/2	0.010	0.015	0.020	0.021	0.025	0.024	0.025	0.025	0.025	0.026	0.027	0.023
				1	0.006	0.018	0.021	0.023	0.025	0.025	0.026	0.028	0.025	0.027	0.028	0.023
II	3	0.66	F	0	0.022	0.016	0.021	0.029	0.031	0.029	0.028	0.030	0.030	0.032	0.030	0.029
				1/4	0.012	0.009	0.018	0.020	0.022	0.027	0.022	0.023	0.025	0.023	0.023	0.019
				1/2		0.016	0.021	0.026	0.026	0.026	0.025	0.026	0.026	0.026	0.026	0.026
				1		0.016	0.012	0.025	0.023	0.022	0.022	0.022	0.022	0.022	0.022	0.021
II	4	0.60	A	0	0.000	0.013	0.016	0.015	0.016	0.018	0.020	0.021	0.023	0.023	0.029	0.032
				1/4	0.004	0.009	0.014	0.015	0.013	0.016	0.018	0.017	0.018	0.018	0.017	0.022
				1/2	0.000	0.007	0.008	0.010	0.009	0.010	0.012	0.012	0.012	0.011	0.006	0.012
				1	0.005	0.010	0.009	0.013	0.014	0.014	0.016	0.013	0.015	0.012	0.006	0.014
I	12	0.58	D	0	0.019	0.019	0.020	0.021	0.028	0.028	0.028	0.031	0.023	0.025	0.028	0.029
				1/4	0.013	0.015	0.013	0.019	0.020	0.021	0.022	0.023	0.014	0.018	0.025	0.025
				1/2	0.014	0.015	0.013	0.017	0.018	0.019	0.018	0.020	0.018	0.017	0.022	0.027
I	13	0.68	D	0	0.003	0.003	0.010	0.016	0.018	0.017	0.017	0.018	0.017	0.018	0.020	0.020
				1/4	0.017	0.020	0.018	0.027	0.027	0.027	0.026	0.028	0.020	0.021	0.027	0.029*
				1/2	0.008	0.010	0.012	0.017	0.016	0.017	0.016	0.019	0.015	0.014	0.016	0.018
I	14	0.93	D	0	0.008	0.006	0.011	0.017	0.022	0.023	0.023	0.027	0.028	0.027	0.037	0.037
				1/4	0.006	0.006	0.005	0.014	0.016	0.016	0.014	0.017	0.015	0.014	0.017	0.018
				1/2	0.002	0.003	0.001	0.008	0.010	0.011	0.008	0.010	0.007	0.005	0.009	0.011
I	15	1.43	D	0	0.012	0.015	0.015	0.022	0.031	0.038	0.040	0.045	0.044	0.045	0.046	0.055
				1/4	0.011	0.011	0.012	0.018	0.022	0.022	0.019	0.022	0.020	0.019	0.024	0.026
				1/2	0.003	0.000	0.000	0.002	0.004	0.004	0.001	0.005	0.004	0.002	0.004	0.007

*The results for this sample are so inconsistent with the rest of the table that some mistake seems probable. The suspected bars supposedly containing 1/4 slag cement were analyzed to contain less alkali than the bars with 1/2 slag cement. Furthermore, the suspected bars match the visual appearance of other bars with 1/2 slag cement better than they do bars with 1/2 slag cement. Therefore, it appears that any mistake must have been in the aggregate or portland cement used.

content were used as reference cements in addition to the above specified cement. Test bars were made of the three reference cements in which one-half as well as one-fourth by absolute of the reference cements were replaced with an equal volume of slag cement. The test results in Table III show that slag cement definitely reduces alkali-aggregate expansion and that the greatest reduction in expansion occurred when one-half of the reference cement had been replaced with slag cement.

Table III
Results of 14-Day Test for Reduction of Expansive Reaction by Blast-Furnace Slag Cement II

Portland		Alkali Content			Percent Reduction in Expansion		Percent Expansion of Reference, No Slag
Number	Type	Na_2O	K_2O	Total as Na_2O	1/4 Slag	1/2 Slag	
8	II	1.10	0.62	1.11	10	70	0.113
9	I	0.16	0.93	0.61	70	89	0.076
10	I	0.13	0.44	0.42	0	70	0.010

Water-Soluble Alkali

In view of the evidence already quoted that slag cement even though high in alkali, not only does not contribute to the alkali-aggregate reaction, but usually reduces it, an attempt was made to explain the differences in behavior between slag and portland cements. Two hypotheses arise immediately: (1) the alkali in slag cement is not available for reaction, or (2) the alkali in slag cement can react, but other characteristics of the slag inhibit the reaction. The experiment to be described was planned to investigate the first hypothesis.

The question has often been considered whether the degree of alkali-aggregate expansion should not be correlated with water-soluble alkali rather than total alkali. Correlation with water-soluble alkali is what one would intuitively expect, and yet experimental results with a wide variety of portland cements have always seemed to correlate best with total alkali. A possible explanation of the failure of the reactive expansion to correlate with water-soluble alkali is that the extraction of so-called water-soluble alkali by ASTM C114-46 is too mild. Suppose, for example, that under more drastic extraction all the alkali could be dissolved from portland cement, whereas only part could be dissolved from slag cement. Then the reactive expansion might correlate with both the total alkali content of portlands and the newly-defined water-soluble alkali of both portland and slag cements.

To test this possibility, two slag cements and one portland cement were tested by (1) ASTM C114-46 for water-soluble alkali and (2) an extraction with boiling water in a modification of a procedure originally designed to leach alkali from glass. In this second test 10 grams of each cement were refluxed in 100 ml. of water for varying time intervals. After the desired boiling time, the cement was filtered off and the filtrate was analyzed for alkali.

The results are shown in Table IV. They do not support the idea that only a part of the alkali from slag cement can be extracted with water; up to 30 hours the alkali is still being extracted at a significant rate. In fact, the amounts of alkali extracted from the slag cements up to 30 hours are quite similar to the amount extracted from the portland. This fact suggests that the alkali from slag cement is available for expansive reaction, but that other properties of the slag inhibit the reaction.

Table IV
Percent Alkali as Na_2O in Slag and Portland Cements

Cement	Total	Water-Soluble by ASTM	Water-Soluble by Boiling Extraction		
			2 hrs.	16 hrs.	30 hrs.
Slag 1	1.39	0.05	0.19	0.33	0.39
Slag 2	0.88	0.05	0.19	0.47	0.57
Portland 3	0.66	0.39	0.36	0.55	.....

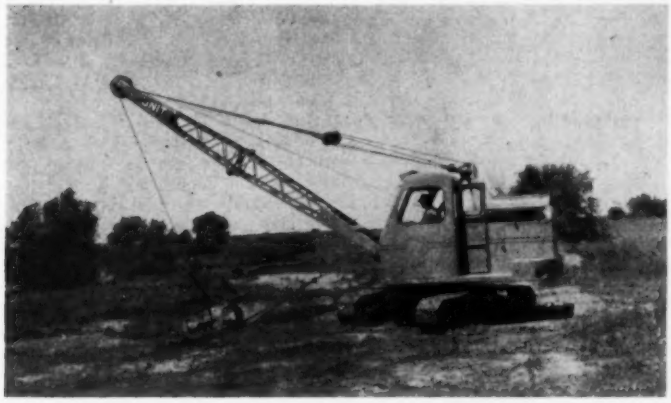
Conclusion

High alkali content in blast-furnace slag cement does not mean that the slag cement will produce or aggravate the alkali-aggregate reaction. On the contrary, the use of slag cement for a part of the portland cement in an otherwise reactive mixture usually reduces the extent of the reaction.

Minor Mishap Starts One-Man Iowa Operation

THE sand and gravel deposit owned by Ed and Carl Zupke of Randalia, Ia., was discovered by accident. While Ed Zupke was laying drain tile on Carl's farm, the ground suddenly gave way and he sank in up to his shoulders. In digging him out the deposit was discovered.

• Ed and Carl Zupke, left to right, are the owners of this small but highly efficient sand-and-gravel plant.



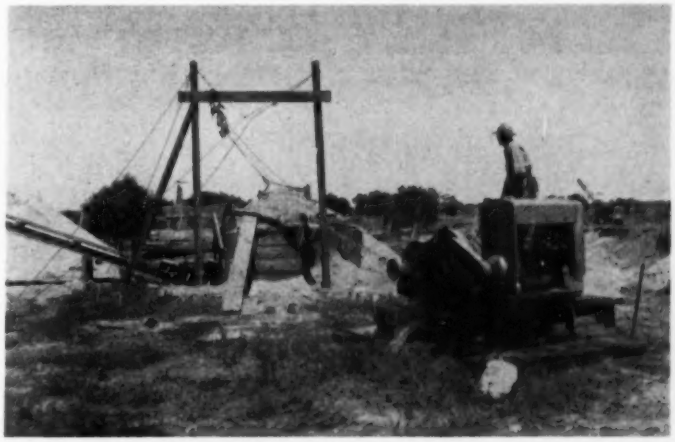
• Overburden is stripped with this highly mobile dragline fitted with a ½-cu. yd. bucket.

The present plant was built in July of 1948. Prior to that year a fair amount of sand had been sold as pit run material. Whenever it rained, however, the sand became contaminated with dirt that was washed down into the pit, rendering the material unsalable. For this reason the owners decided to erect a modern screening and washing plant.

The deposit is covered with a shallow band of dirt about 1 to 2 ft. in thickness which is stripped with a Unit dragline equipped with a ½-cu. yd. bucket. The sand and gravel is recovered with a 3-cu. yd. bucket-scraper pulled by a Construction Machinery Company double-drum hoist. This bucket dumps the pit run material into a hopper positioned over a Universal feeder. An 18-in. by 80-ft. belt conveyor carries the stone to a 3-deck Simplicity vibrating screen, the top deck of which is fitted with a 1½-in. cloth. The second deck is covered with a 1½-in. cloth, and the third with a ¼-in. screen cloth. The over-size off the top deck falls into a wooden bin; the material rejected off the second deck falls into one compartment of a 3-compartment 30-ton Universal bin. That material rejected off the bottom deck is passed into another compartment in the same bin, while the undersize is dropped into a Universal 18- by 20-in. sand washer. Water for this phase of the operation is supplied by a 4-in. Construction Machinery pump powered by a Hercules gasoline engine. The washed sand is sent to the stockpile via a short conveyor.

The entire plant is run off a Continental gasoline 50-hp. motor. The plant has a rated capacity of 125 t.p.h. With the exception of a little sand and gravel which is hauled away in customers' trucks, the bulk of the material is shipped in two company-owned vehicles, one Ford and one G.M.C. In addition to haul charges, which amount to 30 cents for the first ton-mile, 20 cents for the second ton-mile and 5 cents for every ton-mile thereafter, the company charges 75 cents per ton for sand and $1.25 per ton for gravel. The entire plant can be operated by one man.

Ancient salt mines once used by the Hopi Indians were discovered recently at the bottom of the Grand Canyon in Arizona. The caves were found near the Kwagunt Rapid, 56 miles down the river from Lee's Ferry.



• The sand and gravel is dragged up over a feeder with a 3-cu. yd. drag bucket pulled by a double drum hoist.

New Permalite* Plant

By WILLIAM M. AVERY

Great Lakes Carbon Starts Producing Expanded Perlite at Linden, N. J.

another ON THE SPOT report

AMONG the important developments in the rapidly growing perlite industry in this country is the well-engineered rotary kiln plant which was placed in operation about a year ago by the Great Lakes Carbon Corporation. The new plant is located at Linden, N. J., some 15 miles southwest of New York City, and well within practicable shipping distance of the large population centers on the East Coast. It has a capacity of approximately 75 tons per day. Great Lakes Carbon has for some 25 years pioneered in high-temperature manufactuing of a wide range of products for industry, and the new plant at Linden is the culmination of many years of specific research and development work in the field of expanded perlite. In addition it incorporates in its design a vast fund of practical experience gained in pilot-plant and large-scale production operations at the company's West Coast** perlite plant. Operations of the latter unit, which is located at Torrance, Calif., began about four years ago. During the last year this plant was entirely rebuilt and its capacity approximately doubled. The two plants are quite similar in design, but the West Coast installation has two kilns, as compared with one at the New Jersey plant.

The product made at both plants is called Permalite. It is an insulating plaster and concrete aggregate developed and perfected by Great Lakes after some years of laboratory work and extensive field testing. The building industry's quick acceptance of the material brought about the company's decision to expand the capacity of the West Coast plant and to build an entirely new plant to serve the Eastern seaboard.

In the early stages of the development of Permalite, Great Lakes' geologists visited 14 states and 4 foreign countries in search of uniform, high grade deposits of ore. After testing samples from more than 400 deposits, five ore deposits, with total reserves of more than 25,000,000 tons, were finally selected as meeting the rigid quality standards set. At the present time both processing plants are being supplied with ore from a quarry located near Socorro, N. M. The material is crushed and sized at the quarry.

The Linden plant, which is the primary subject of this report, is located on an excellent, level 76-acre site on the outskirts of the city. Two sidings, both served by the Pennsylvania Railroad, provide for incoming shipments of raw ore and outgoing shipments of Permalite without interference. Sized ore is unloaded from box cars with a ½-cu. yd. Butler Bin Scoop which discharges the material onto a grizzly at car floor level. From there it is conveyed and elevated to a 13-ft. diameter by 50-ft high concrete stave storage silo which can accommodate about seven carloads.

The ore is fed from the silo by gravity into a bucket elevator which discharges into an overhead storage bin. The kiln is fed by gravity from this single-compartment bin, which holds approximately 100 tons of sized material. The kiln is oil-fired, and lined throughout with fire brick. It is pitched slightly in the direction of flow. The drive speed can be varied. Maximum temperatures vary depending on the moisture content of the ore and other variables.

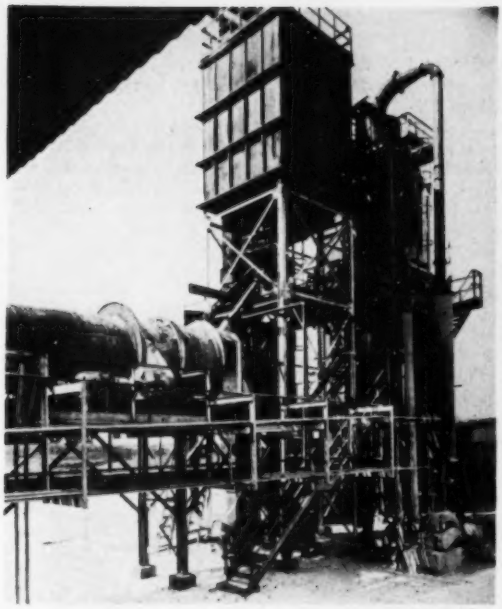
The expanded material is discharged from the end of the kiln to a rotary metal dryer and then to a gravity scalping screen, where fused particles are removed. This screen, which receives some vibration from

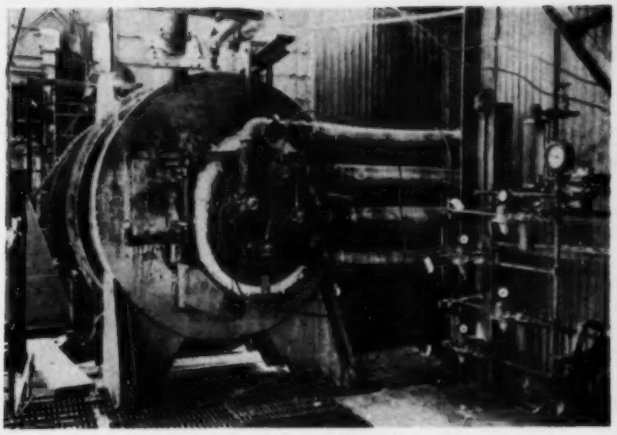
*Reg U. S. Patent Off.

**See Utley, Harry F.: *Great Lakes Carbon Corp. Turns Out 10,000 Bags of Permalite per Day*, PIT AND QUARRY, August, 1950, page 85.

● Glen Stahl, superintendent of the Great Lakes Carbon Corporation's new plant at Linden, N. J.

● A general view of Great Lakes Carbon Corporation's single-kiln Permalite plant at Linden.

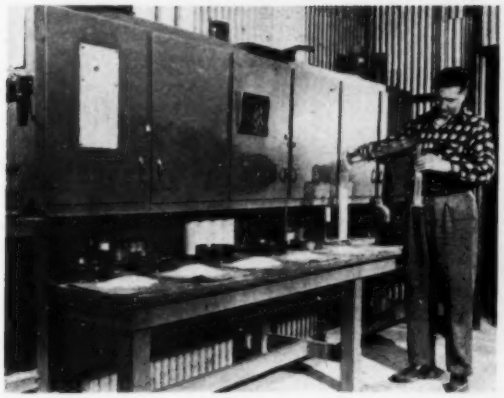


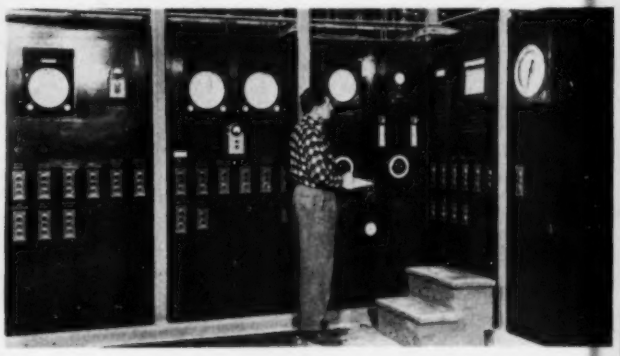


• A closeup of the firing end of the 5-ft. diameter by 25-ft. long rotary kiln. Fuel oil is used for firing.

• Left: A view of the kiln and of the storage and processing facilities at the feed end.

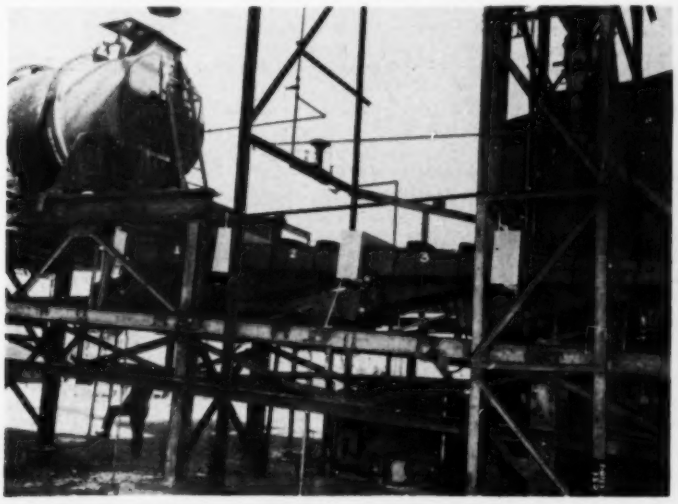
• Below: The elaborate control system for the process is centralized on panel boards located in the building proper.



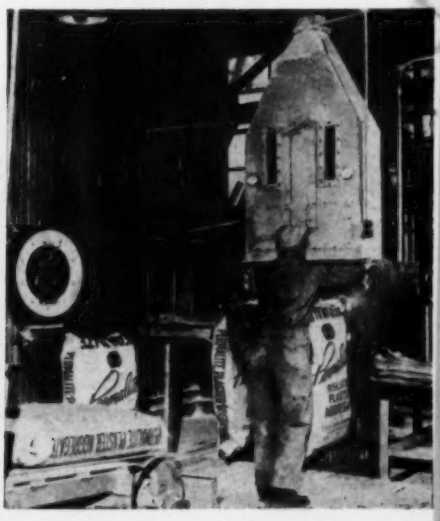


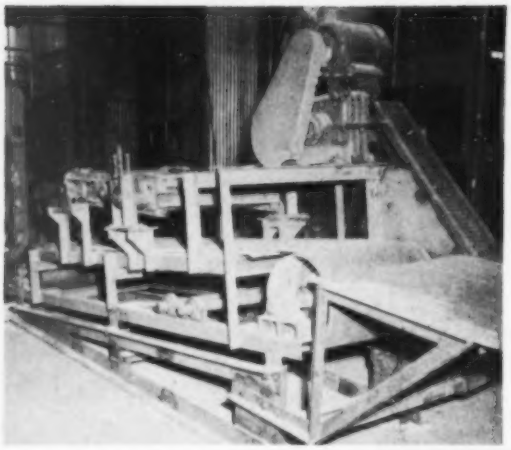
• Control of quality is maintained by means of frequent tests carried out in a well equipped laboratory.

• Below: The four water-jacketed vibrating conveyors which move the expanded material from the discharge end of the kiln to a gravity scalping screen.



• Below: A closeup of the bagging operation. The bag at the left is entering a bag-leveling machine developed by Great Lakes Corporation's own engineering staff.





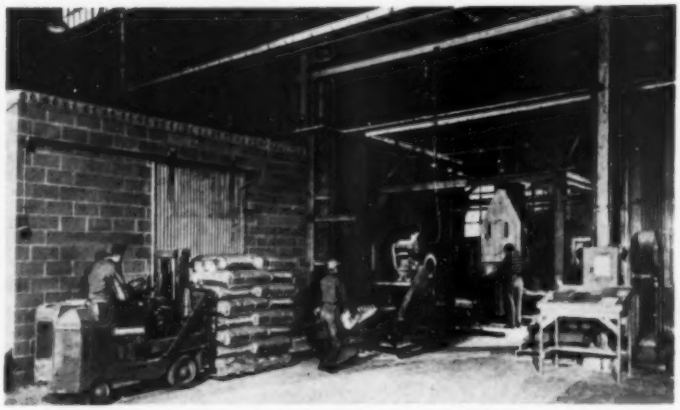
• A full view of the bag-leveling machine from the discharge side.

the adjacent conveyors, is also water-jacketed to expedite the cooling of the product. It is fitted with No. 4 mesh cloth. The material passing this screen is immediately elevated to the finished product bin.

In order to prevent segregation, the finished Permalite is packed in bags just as fast as it is produced; i.e. there is no bulk storage of the expanded material, although storage capacity is available in the event of a hold-up in the packing operation. This continuous packing feature is accomplished by means of a 40-in. vertical tube extending from the top of the bin down into the bagging machine. The Permalite is discharged from the elevator directly into this tube. As soon as a 4-cu. ft. head is accumulated, the tube is emptied. The bagging is done with a two-spout Vreedenberg packer, using 2-ply multiwall valve bags.

For ease of handling and convenience in palletizing, the loaded bags are run through a special bag-leveling machine developed by Great Lakes' own engineers. The leveling is accomplished by passing the bags through an adjustable throat formed by a series of driven rollers suspended over a belt conveyor. Two vibrators attached to the frame of the bag leveler cause some additional compaction of the material as the bags are leveled. The result is an extremely rigid bag which shows no appreciable sag even when supported at the extreme ends.

The leveled bags are stacked on Take-It-Or-Leave-It wooden pallets, which are handled with an LT-48 Towmotor fork truck equipped with a pusher attachment. The combination of the pusher attachment and the special pallets makes it possible to handle and store the bagged material on pallets up until the time it is to be loaded into cars or trucks for shipment, when the load is lifted from the pallet with the truck forks and then shoved off the forks with the pusher attachment. In this way the pallets are kept at the plant. Twenty-one bags, with an approximate total weight of 630 lbs., are loaded on each pallet.



• Bags are taken manually from the leveling machine and stacked on wooden pallets. The fork truck is equipped with a pusher attachment so that the bags may be shoved off the pallets when they are loaded into boxcars or trucks.

Each loaded pallet is weighed on a Fairbanks-Morse 1000-lb. platform scale. This is necessary because the product is shipped under average weight agreements with shippers. There is also a smaller scale next to the packing machine where single bags can be checked.

One of the outstanding features of the Linden plant is an elaborate and all-inclusive electronic control system for assuring uniform quality output. Every conceivable automatic device has been incorporated to maintain the rigid temperature control which the process demands, and Brown Instrument recording charts are used extensively to show temperatures at all critical points. One of these instruments alone records kiln temperatures alternately with temperatures of the product leaving the cooling conveyor, with the kiln cyclone outlet, with the hot gas to the dryer, with the mixed gas to the dryer, and with the product entering the cooling conveyor.

The quality of Permalite is additionally controlled by means of a well-equipped laboratory located in the main plant building. Frequent tests are made here on the size, density and crushing strength of the perlite ore, and similar tests are made at least once every hour on the finished product.

For the present the entire output of the Linden plant will consist of plaster and concrete aggregate. Even with the present setup, however, it would be possible to shift production to other sizes by changing the screens. In designing the plant, provisions were made for the installation of additional kilns at some time in the future. The main plant building measures 60 by 165 ft., and except for the relatively small amount of space occupied by the bagging machine, the centralized control panels, and the laboratory facilities, this entire area is available for storage. All other facilities are located outside the building. Dust-laden flue gases are passed through a Buell dust collector, washed, and drained to waste through a slurry line.

The end product (plaster aggregate) of this elaborate processing system weighs approximately 7½ lbs. per cu. ft. It reaches the point of use in bone dry condition. On the wall (dry) Permalite plaster is said to have a density of 35 to 45 lbs. per cu. ft., or about ⅓ the weight of sanded plaster. In a 1:2 mix (by volume) it has an average compressive strength of 490 p.s.i. and an average tensile strength of 120 p.s.i. Permalite itself is said to withstand

(*Continued on page* 103)

California Concerns Set Up 400 T.P.H. Plant for Canal Job

By HARRY F. UTLEY

another ON THE SPOT report

CONCRETE lining of a 28-mi. stretch approaching the southern terminus of the Delta-Mendota Canal is proceeding on schedule this summer and fall near Los Banos, Calif., with completion of this section scheduled for December, 1950.

Contract for this particular portion is the joint venture of Morrison-Knudson Co., Inc., and M. H. Hasler Construction Co.

The Delta-Mendota Canal of the U. S. Bureau of Reclamation's Central Valley Project in California runs in a general southerly direction from the delta of the Sacramento and San Joaquin Rivers, west of Stockton, to the general vicinity of Mendota—total length about 120 miles.

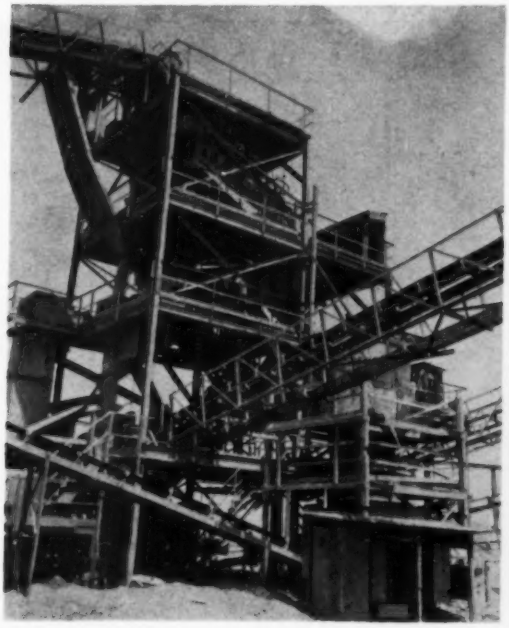
The contractor has set up engineering headquarters in Los Banos, with aggregate and batch plants located a few miles from town at a convenient central point along the contract. Fortunately, a good creek deposit of sand and gravel lies close by for processing in the 400-t.p.h. plant erected near the route of the canal.

• A general view of the Morrison-Knudson & Hasler aggregates plant. The main conveyor and return conveyor from the crusher are at the right. The radial sand stacker is seen at the left in the distance.

The plant is of all-steel construction and was designed and equipped by the contractor in cooperation with the Conveyor Co., Los Angeles. Rigid sand specifications are being met successfully by blending natural sand with manufactured fines ground from pea gravels.

Three bottom-dump Mississippi wagons drawn by International tractors carry about 15 cu. yds. per trip from pit to plant hopper, a haul of about 1,500 ft. Material is excavated and loaded by a Northwest 80 diesel 2½-cu. yd. shovel. Digging is a selective process as the sand and coarse aggregate are definitely stratified through the deposit.

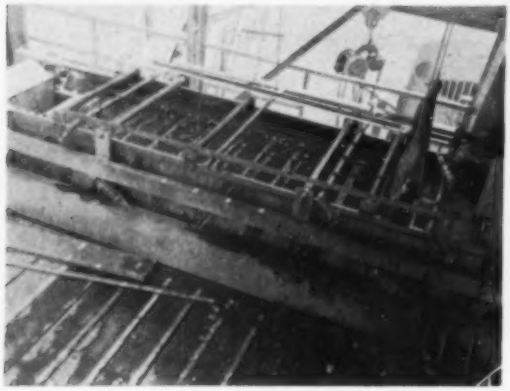
From the receiving hopper, a Conveyco 3- by 8-ft. plate feeder puts the material on the 36-in. by 226-ft. main belt conveyor running up to the top of the plant. Although the pit-run contains boulders up to

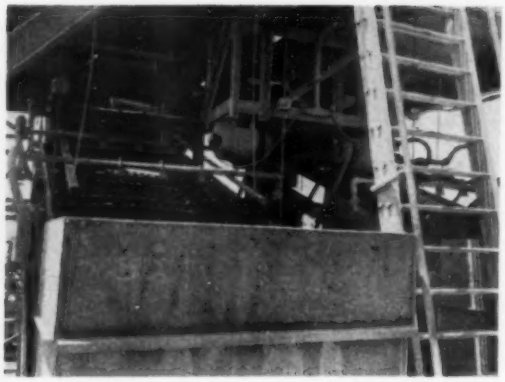


• Left: A closeup of the screening and crushing plant tower. The reduction crusher is at the lower right.

• Two of the 15-cu. yd. wagons from the pit approach the plant hopper after a 1,500-ft. haul from the pit shovel.

• Below: This 4- by 14-ft. screen separates the two top sizes of finished gravel.





• The pair of 4- by 12-ft. screens which bypass sand and take out some of the finished gravel.

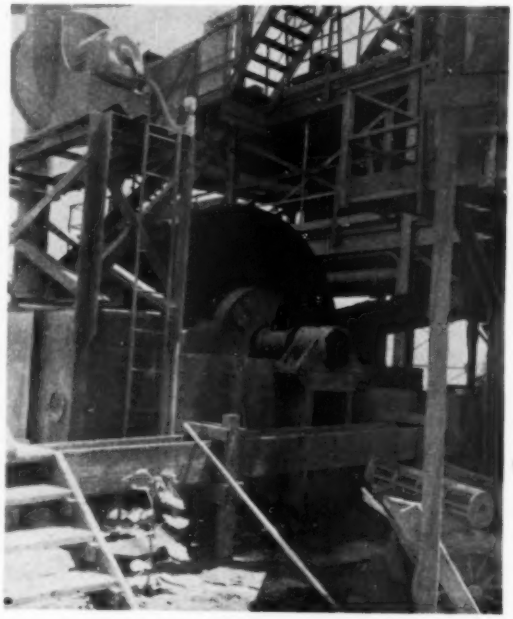
9 in., the double-acting feeder with split reciprocating plates lays a uniform layer on the belt at all times and the load, variable up to 500 t.p.h., can be remote-controlled at the desired rate from the operating floor. Coming off the belt, the material splits to a pair of Ripl-Flo 5- by 14-ft. double-deck wet screens, the upper deck scalping off the plus 1½-in. which drops to a Traylor 4-ft. TY crusher below. The crusher is set at about 1 in. and is the only crusher used in the processing operation. It is in closed circuit with the screens just mentioned, the return being via a 24-in. by 140-ft. belt conveyor to a point about midway of the main pit-run conveyor.

Earlier it had been planned to take out the extreme crusher fines before delivering the product of the TY machine back to the plant conveyor, in accordance with the original specifications, so a 4- by 10-ft. Symons screen was erected above a waste bin at the point of return. This installation was made but has never been operative, the screen being bypassed, and all the crusher product is returned to the circuit. Reclamation Bureau engineers agreed that this step was unnecessary since a good deal of the fine sand used is manufactured anyway later on. The minus 1½- plus ⅜-in. gravel retained on the lower decks of the screens is washed and separated into 1½- to ¾-in. and ¾- to ⅜-in. finished products by a Symons 4- by 14-ft. screen and each of the two grades is carried by separate 18-in. stacker belts to storage piles.

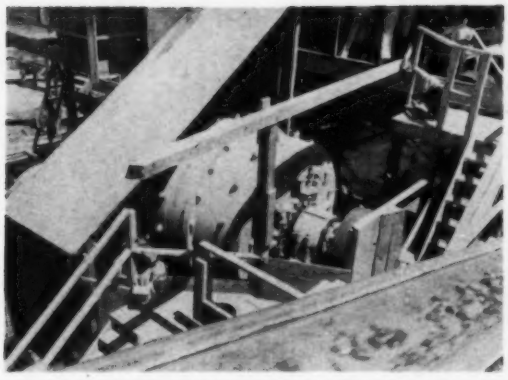
Throughs from the two Ripl-Flo screens, consisting of minus ⅜-in. gravel and sand, go on to a second pair of Ripl-Flo 4- by 12-ft. single deck screens which take out a minus ⅜-in. to No. 4 finished product, which goes by still another 18-in. stacker belt to build up a third storage pile. The minus No. 4 throughs (sand) and water from this second pair of Tripl-Flo screens are flumed to a splitter tank feeding a 6- by 10-ft. Conveyco vacuum sand classifier, the classifier product passing to a short belt feeding a 24-in. by 134-ft. radial stacker which builds up a sand storage pile.

The Conveyco sand classifier has been mentioned previously in these columns, but it is such a relatively new piece of equipment for producing and dewatering sand that some descriptive and operating data should be of interest. The unit in use at Los Banos is said to be the largest wheel yet installed, being 10 ft. in diameter and 6 ft. wide. The buckets decant surface water in the first cycle, further dewater the sand through round filtering brushes fitted into the bucket bottoms in the second cycle, aided by powerful vacuum suction. The vacuum is created by a 3,500 c.f.m. turbine air compressor mounted above the vacuum tank. Were the classifier operated at its designated speed of about 1 or 1½ r.p.m., the sand would contain practically no migratory water and would be almost completely dried. However, the demands of the batching plant for sand were so great that the contractor has been forced to speed up the wheel several times the normal pace to obtain a required tonnage of 175 t.p.h., but with a resultant sacrifice of sand dryness. The sand is allowed to remain in storage for sufficient time for natural drainage to remove the excess moisture.

Sand supply is augmented by



• The 6- by 10-ft. sand classifier equipped with a vacuum dewatering system. The turbine compressor (above) creates the vacuum.



• Sand is manufactured in this No. 75 ball-mill, utilizing pea-gravel as feed.

grinding some of the ⅜-in. gravel in a Marcy No. 75 ball-mill. Mill feed comes off the belt carrying this grade of material to the stockpile previously mentioned. A split chute and variable speed belt-feeder control the volume of gravel fed to the ball-mill and this, too, is regulated by remote control from the operating floor. The mill is in closed circuit on the product end, with a 4- by 8-ft. Symons single-deck screen carrying No. 16 mesh; throughs are flumed to the sand wheel and oversize return to the mill. The ball-mill was initially charged with about 12 tons of steel balls, about equally divided between 3-, 2-, and 1½-in. media. As these wear away, more 3-in. balls are added from time to time.

Two 24-in. recovery belts operate in tunnels under the finished aggregate storage piles, one beneath the three gravel piles and the other under the elongated sand pile. All tunnel gates are remote-controlled from the batch-plant floor and all aggregates are subject to final re-screening by a pair of Symons 3-deck units above the batch-plant compartment bin.

Water for washing and other purposes is pumped by a Western 12-in. turbine pump from a 600-ft. deep well to supply the maximum requirement of 1,200 g.p.m.

Concrete is dry-batched into trucks which deliver to the mixers serving the special slip-form paving machine at the canal excavation. Proportions are under critical control constantly to produce a dry concrete (about 2-in. slump) of the required consistency to suit the temperament of the huge traveling machine which places and trowels the side and bottom linings. The sand, particularly, is subject to constant scrutiny to maintain the gradation specification set up by the Bureau of Reclamation. The sieve analysis follows:

Screen Size	Individual Percentage Retained (by Weight)
No. 4	0– 5
No. 8	5–20
No. 16	10–20
No. 30	10–30
No. 50	15–35
No. 100	14–20
Pan	3– 7

Concrete yardage needed to complete the contract will be in excess of 230,000, an average of 1,750 cu. yds. being placed daily. Translated into lineal footage of 4-in. thick canal lining, this is about 1,350 ft. The canal excavation is done with draglines, with the giant trimmer and slip-form concreting machines following on rails. The maximum haul from batch plant to job was 18 mi. and the largest fleet of batch trucks — 40 — was then in use. Twenty-three of these, KB-8 Internationals, belong to the contractor; the others were rented as needed.

Communication over the far-flung operations is nicely taken care of by a Link Radio Corporation two-way short-wave radio system. Master units are in headquarters at Los Banos and in the warehouse adjoining the aggregate and batching plants, with 11 mobile units on cars and pickup trucks in the field. The communication radius is 20 mi. from the master stations to the mobile units, and 8 mi. between cars.

For the Bureau of Reclamation, the work on the Delta-Mendota Canal is under the direction of Oscar G. Boden, construction engineer. Oliver H. Folsom is resident engineer.

Contractor personnel includes: W. J. Darkenwald, project manager; George Renauld, general superintendent; Ed White, aggregate and batch plant superintendent; James Ricker, paving superintendent; Dallas Mathews, master mechanic; Arthur Gray, project engineer; and Frank J. King, office manager.

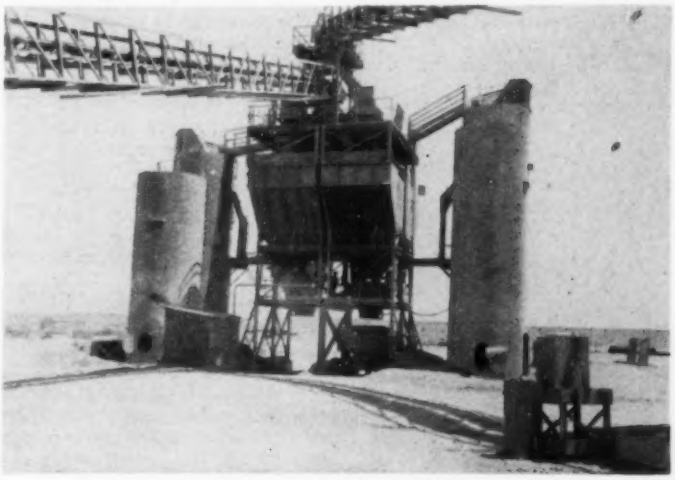
New Permalite Plant

(*From page* 100)

temperatures up to 2,300 deg. F. without melting. It has excellent thermal and sound absorption properties.

As stated earlier, the rated capacity of the Linden plant is 75 tons per day. This figure is somewhat misleading, since Permalite is a light material even by comparison with most other lightweight aggregates. Stated in terms of volume, the new plant will turn out something over 18,900 sq. ft. per 24-hour day, making it one of the larger lightweight aggregate producing operations in the country.

Thirteen member firms of the Southern California Rock Association recently granted 12½-cent-an-hour pay hikes to 2,400 workers in the rock, sand, and gravel industries in this area.



• Twin batch plants are served by three bulk cement silos. All output is dry batched into dump trucks.

Industrial Sand Producers Fall Meeting at Colorado Springs

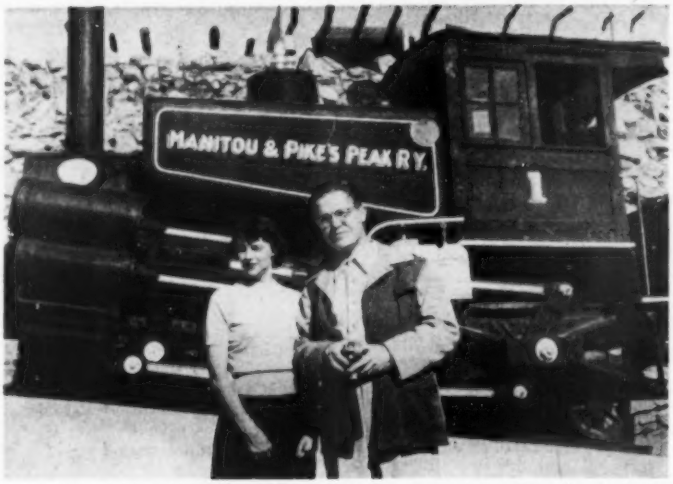
CLOSE to a hundred people, including the top officials of member-companies and their wives and families, attended the semi-annual meeting of the National Industrial Sand Association at The Broadmoor, Colorado Springs, Colo., October 10 to 12. A full schedule of informal round-table discussions, and a penetrating review of the Washington scene by the organization's executive secretary, covered

By
WILLIAM M. AVERY

virtually every phase of the industry's operations in the present period of national emergency. This necessarily somewhat grim aspect of the gathering was relieved to a considerable extent by the fine weather which prevailed throughout the week, enabling many of the group to take part in tours to Pike's Peak, Cheyenne Mountain, the Garden of the Gods, and other points of interest in the locality.

At the opening session Emery M. Durstine, chairman of the traffic committee, announced that the association's bonded sand complaint has been briefed and filed, and that copies of the brief will be printed and made available to those who are interested. In referring to the general rate complaint, Mr. Durstine said that there has been some delay due to the illness of the association's traffic counsel.

A discussion of railroad car supply revealed several interesting aspects of this almost perennial problem. The present shortage of gondolas is at the rate of 15,000 to 16,000 cars per day, and the figure is close to 20,000 per day for box cars. In an effort to overcome these serious shortages, the railroads now have about 81,000 new cars on order. Of this number, 19,000 are gondolas, over 4,000 are covered hoppers, and 39,000 are boxcars. These figures represent an important gain over a year ago, when only 7,000 gondolas, 1,700 covered hoppers and 5,500 boxcars were on order.



Mr. and Mrs. William H. Paddison (Great Lakes Foundry Sand Co., Detroit) were in the party that made the Cheyenne Mountain trip.

It was pointed out that the cars now on order will not be available for many months to come, and that the silica sand industry must therefore expect the present shortage to persist for at least the next two years. During this period it seems inevitable that repair and cleaning of cars will continue to be a serious problem. As of September first of this year, 34,000 box cars, 19,000 gondolas and 46,000 hopper cars were awaiting repairs. A year ago the corresponding figures were 44,000 for box cars, 27,000 for gondolas, and 34,000 for hoppers.

Off-the-cuff statements were made by various producers on industry prospects for the remainder of 1950 and for 1951. In general the plants represented in these reports are producing at rates equal to, or in excess of 1949, and several instances of two- and three-shift operation were disclosed. Where increase in 1950 volume over 1949 was mentioned specifically, the amounts for individual companies ranged from 10 to 30 percent. Several company officials predicted that output would increase in 1951, but such predictions were hedged by some reference to the problem of car supply.

Developments in matters relating to industrial health were reported by Theodore C. Waters, association counsel. Noting that there has been a considerable increase of activity among state and city agencies to effect control of the contamination

Mr. and Mrs. Arthur B. Schlesinger (New Jersey Pulverizing Co., New York, N. Y.).

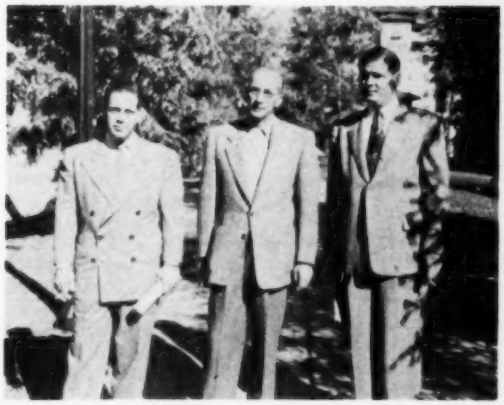
Mr. and Mrs. E. M. Durstine (Keener Sand & Clay Co., Columbus, O.).

Left to right: Mr. and Mrs. G. M. Mason (Concrete Materials Co., Waterloo, Iowa); George F. Pettinos Jr. (George F. Pettinos, Inc., Philadelphia, Pa.); and E. M. Durstine (Keener Sand & Clay Co., Columbus, O.).

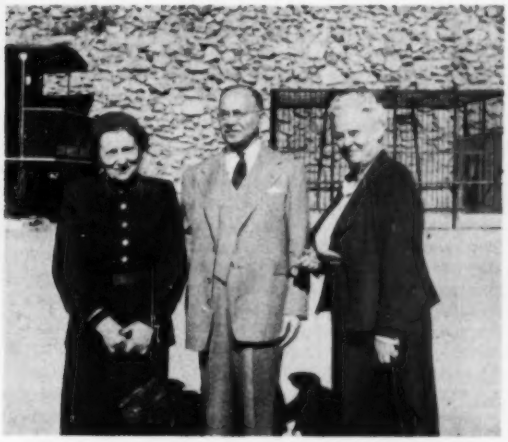
Mr. and Mrs. Marcus S. Wright Jr. (South River Sand Co., Old Bridge, N. J.) photographed at the Will Rogers memorial on Cheyenne Mountain.

Mr. and Mrs. A. Y. Gregory (Whitehead Brothers Co., New York, N. Y.).

Left to right: Mr. and Mrs. Junius M. Strouss (Deckers Creek Sand Co., Morgantown, W. Va.); Mrs. Theodore A. Waters; and Mrs. C. R. Wolf.



Tom H. Hardy (Hardy Sand Co., Evansville, Ind.); Sterling Farmer (Sand Products Corp., Cleveland, O.); and Robert W. Muhlitner (Great Lakes Foundry Sand Co., Detroit, Mich.).



Right: Mr. and Mrs. A. Warsaw (Wedron Silica Co., Chicago, Ill.) and Mrs. Walter B. Lenhart.

Mr. and Mrs. E. J. Campbell and Harte Campbell (Sun Sand Co., Thayer, W. Va.).

of atmosphere and waters, the speaker reminded his audience that industrial sand producers have a real responsibility in this connection. He predicted that there will be increased pressure to require the elimination of pollutants, not only in the atmosphere, but in the streams used for industrial purposes.

During the present year, Mr. Waters said, 12 states have amended their workmen's compensation laws, the amendments dealing in most instances with increased benefits for death, disability, and medical care. In Massachusetts restrictions applicable to silicosis and other pulmonary dust diseases have been eliminated, and claims for silicosis are now subject to the same provisions as other injuries (except for a monetary limit of $5,000 in the granite industry). Until the enactment of the 1950 amendment, partial disability for dust diseases was denied, but that restriction has now been removed.

In Rhode Island the time limit for claims in occupational disease cases has been extended to 24 months after the date of disablement, instead of the date of contraction of the disease. This is a significant change, Mr. Waters said, because of the tendency of courts to construe compensation statutes to have limitations of time for the filing of claims run from the date when the claimant knew, or ought to have known, that he had the disease. Particularly in silicosis cases, this construction of the statutes opens the door to the filing of claims by former employees years after their employment has terminated.

With all but four of the state legislatures due to be in session in 1951, Mr. Waters stated that it is inevitable that there will be drastic amendments proposed with respect to the employer's liability for compensation. He urged silica sand producers to follow such developments closely to avoid the enactment of unreasonable restrictions affecting liability and insurance rates.

Mr. Waters also discussed the proposed Code of Industrial Hygiene which is now under consideration by the State Department of Health of West Virginia. The proposed code contains a schedule of maximum allowable concentrations of various gases, vapors and dusts, including the following concentrations applicable to silica: In excess of 50 percent free SiO_2 — 5,000,000 particles per cu. ft. of air; 5 to 50 percent free SiO_2 — 20,000,000 particles per cu. ft. of air; less than 5 percent free SiO_2 — 50,000,000 particles per cu. ft. of air. The code also includes the recommendation for a maximum allowable concentration of total dust exposure not to exceed 50,000,000 particles per cu. ft. of air. While it specifies that the maximum allowable concentrations shall be used as a guide in appraising health hazards, it states specifically that "workers shall not be exposed to concentrations of atmospheric contaminants hazardous to health".

Mr. Waters stated his belief that it is proper for the industrial sand industry to ask that only such provisions should be enacted into law as are reasonable and practicable of attainment. State control is virtually inevitable, he added, and it is simply good business to operate plants in a manner that is protective of the health of employees.

In regard to insurance rates on silicosis, Mr. Waters stated that experience under the Silicosis Compensation Acts is continually improving, and that a continuing reduction of rates may therefore reasonably be anticipated. There has been, however, no expression of commitment on the part of officials of the National Council on Compensation Insurance regarding rate reductions for next year.

Referring to a trend in workmen's compensation legislation relating to the use of medical boards and examiners in occupational disease claims, the speaker expressed the opinion that extending the use and increasing the power of such boards will materially improve the administration of existing laws. At the present time, Mr. Waters said, the occupational disease statutes of 26 states have some provision for medical examinations of claimants. Although the decisions of the medical boards are binding in only 12 states, in practice most of the commissions, upon appeal, follow the findings and recommendations of the medical boards.

Several interesting developments were brought out in a discussion of problems related to the packaging of ground silica sand. Two members reported on the operation of an open-mouthed bag-filling machine originally developed for bagging such fibrous materials as asbestos and rock wool. Using rectangular bags, this two-spout machine fills, closes and seals the bags automatically. It packs ground silica sand with a reduction of about 20 percent in volume as compared with bags filled by conventional machines. The bagging rate is 22 per minute with one operator. Both observers stated that a number of design changes would be necessary to adapt the equipment to ground silica use.

Another new machine described was the Auger-Matic Packer, designed for bagging granular, pellet, or pulverized materials. This unit employs a screw conveyor to deliver material to a 3-in. diameter tube from which the bag to be filled is suspended. It is said to work equally well with valve bags and with so-called tuck-in bags. The material is fed from a V-shaped hopper which is mounted on top of a cabinet measuring 30 in. in width by 45 in. in height. It can be set to fill bags ranging from 25- to 100-lb. capacity. The rate of production on silica sand appears to be one 100-lb. bag in about six seconds.

One entire session of the three-day meeting at Colorado Springs was devoted to discussion of governmental actions in the national emergency which affect the industrial sand industry. Attention was called

(*Continued on page 114*)

DONT'S

**This is the latest revision of "Don'ts" adopted by the Institute of Makers of Explosives, September 26, 1947. It supersedes all previous lists of "Don'ts" issued by the Institute.*

FOR the purposes of this list of "Dont's" the terms contained therein shall be as follows:

The term "explosives" shall signify any or all of the following: dynamite, black blasting powder, pellet powder, blasting caps, and electric blasting caps.

The term "electric blasting cap" shall signify any or all of the following: instantaneous electric blasting caps, delay electric blasting caps, and delay electric igniters with blasting caps attached.

1. Don't purchase, possess, store, transport, handle, or use explosives except in strict accordance with organizational, local, state, and federal regulations.

2. Don't store explosives anywhere except in a magazine which is clean, dry, well ventilated, properly located, substantially constructed, and securely locked.

3. Don't leave explosives lying around where children can get them.

4. Don't allow leaves, grass, brush, or debris to accumulate within 25 feet of an explosives magazine.

5. Don't smoke or have matches, open lights, or other fire or flame, in or near an explosives magazine, or have them nearby while handling or loading explosives.

6. Don't shoot into explosives with any firearm, or allow shooting in the vicinity of an explosives magazine.

7. Don't store any metallic tools or implements in an explosives magazine.

8. Don't drop, throw, or slide packages of explosives or handle them roughly in any manner.

9. Don't open kegs or cases of explosives in a magazine.

10. Don't open kegs or wooden cases of explosives with metallic tools. Use a wooden wedge and wooden, rubber, or fiber mallet. Metallic slitters may be used for opening fiberboard cases, provided that the metallic slitter does not come in contact with the metallic fasteners of the case.

11. Don't store or leave packages of explosives which have been opened without replacing the cover.

12. Don't use empty explosives cases for kindling.

13. Don't permit any paper product used in the packing of explosives to leave your possession. Accumulations of fiberboard cases, paper case liners, cartons, or cartridge paper should be destroyed by burning after they have been carefully examined to make sure that they are empty.

14. Don't use explosives that are obviously deteriorated.

15. Don't attempt to reclaim or use fuse, blasting caps, electric blasting caps or any other explosives that have been water-soaked, even if they have dried out. Consult the manufacturer.

16. Don't carry explosives in pockets of clothing.

17. Don't make up primers of explosives in a magazine or near excessive quantities of explosives.

18. Don't force cartridges of any explosives into a bore hole or past any obstructions in a bore hole.

19. Don't allow explosives, or drilled holes while being loaded with explosives, so be exposed to sparks from steam shovels, locomotives, or any other source.

20. Don't spring a bore hole near another hole loaded with explosives.

21. Don't load a sprung bore hole with another charge of explosives until it has cooled sufficiently.

22. Don't tamp with metallic bars or tools. Use only a wooden stick with no exposed metal parts.

23. Don't use combustible material for stemming.

24. Don't allow near the danger area of a blast any persons not essential to the blasting operations.

25. Don't figure a blast until all surplus explosives are in a safe place, all persons and vehicles are at a safe distance or under sufficient cover, and until adequate warning has been given.

26. Don't return to the face until the smoke and fumes from the blast have been dissipated by adequate ventilation.

27. Don't attempt to investigate a misfire too soon. Follow all applicable rules and regulations, or, if no rules are in effect, wait at least and hour.

28. Don't drill, bore or pick out a charge of explosives that has misfired. Misfires should be handled only by a competent and experienced man.

29. Don't abandon any explosives. Dispose of or destroy them in strict accordance with the methods recommended by the manufacturer.

30. Don't store cases of dynamite so that the cartridges stand on end.

31. Don't leave dynamite, black blasting powder, or pellet powder in a field or any place where livestock can get at them.

32. Don't take surplus quantities of permissible dynamite, black blasting powder, or pellet powder into a mine at any one time. These explosives deteriorate rapidly in a damp atmosphere.

33. Don't use black blasting powder or pellet powder with permissible explosives or dynamite, nor dynamite with permissible explosives, in the same bore hole in a coal mine.

34. Don't tamp pellet powder in a bore hole hard enough to crush the pellets, because of danger of premature explosion.

35. Don't store blasting caps or electric blasting caps in the same box, container, or magazine with other explosives.

36. Don't leave blasting caps or electric blasting caps exposed to the direct rays of the sun.

37. Don't insert a wire, a nail, or any other implement into the open end of a blasting cap to remove it from a box.

38. Don't strike, tamper with, or attempt to remove or investigate the contents of a blasting cap or an electric blasting cap.

39. Don't try to pull the wires out of an electric blasting cap.

40. Don't connect blasting caps or electric blasting caps to Primacord except by the methods recommended by the manufacturer.

41. Don't use in the same circuit electric blasting caps made by more than one manufacturer.

42. Don't handle explosives during the approach or progress of an electrical storm. All persons should retire to a place of safety.

43. Don't make electrical connections without first making sure that the ends of the wires are clean.

44. Don't allow electrical connections to come in contact with other connections, bare wire, rails, pipes, the ground, or other possible sources of current or paths of leakage.

45. Don't have electric wires or cables of any kind near electric blasting caps or bore holes charged with explosives except at the time of, and for the purpose of, firing the blast.

46. Don't use electric blasting caps in very wet work unless they have adequate water resistance and

(*Continued on page* 110)

*Reprinted from *The Explosives Engineer*, July-August, 1949.

Report on Current Labor Developments

By S. HERBERT UNTERBERGER
Research Director
Labor Relations Information Bureau
Washington, D. C.

What Employers Are Doing

REMOBILIZATION has already brought with it many new regulations affecting the labor force of every employer. Additional regulations are on the way; and all of the regulations are almost certain to become more stringent as the defense program grows.

With respect to these controls, many employers, remembering vividly their problems under World War II controls, are using the short time yet available before full-scale controls are imposed to do what they can to get ready. They are looking forward to a long period of controls, and they would like to operate as successfully as possible under those conditions. Here are some of the things those employers are doing.

They reason that the regulations affecting their labor supply are essentially of three types: selective service regulations; manpower regulations; and wage regulations. These employers are reviewing their labor forces to determine the possible impact of the draft and striving to prepare for it. They are reviewing their products and their customers to determine their claims to essentiality under manpower controls. They are studying their wage rates and wage structures, including fringe matters and employee benefits (such as pension plans), to determine whether they will stand up during a long period of wage controls. Employers who have substantial labor relations staffs of their own have put them to work on these problems. Many other employers whose staffs are already over-burdened have turned to skilled labor relations counsel to have their situations reviewed quickly and to secure recommendations for immediate action. Specifically, these are some of the things they have done.

Selective Service

The present goal is to have 3,000,000 men under arms as quickly as possible. The Defense Department and the Selective Service Administration have made abundantly clear what kind of men they plan to use. Right now it appears that every man under the age of 27 is vulnerable. To be sure, veterans with dependent children will be the last of this group to go. Nevertheless, it appears likely that even they will be called if the armed services are to meet their numerical goal.

Many employers, recognizing this cold fact, have very carefully reviewed their labor force and segregated those who are likely to be drafted. On the basis of information already available, it is possible to determine with some degree of accuracy the sequence with which these men will be called. To do this takes real study of the Selective Service regulations, their instructions to local boards, and their other public statements. The latter are changing almost from day to day; therefore the list has to be revised from time to time. While a fairly high proportion of eligibles are being rejected for physical reasons, it would be an error to assume that that high rate will continue, or that once rejected, a man is permanently ineligible. Substantial changes are being made in the physical requirements, and the armed services are finding real uses for "limited service" men.

Only after such a listing is developed is it possible to see how serious the effect of the draft will be; and only then can an employer take steps to mitigate this effect. In plants where some of the vulnerable men have key jobs or have skills which are very difficult to replace, employers are already setting down the bases for requests for deferment. This plan has the obvious advantage of being prepared when the time comes; but it has another very significant advantage. Having set down the basis for deferment, many employers have concluded that they really have very little chance for securing the deferment and are therefore taking other steps to protect themselves. Such measures include training draft-free men or women as replacements and breaking down the skilled job into components so that they can be performed by less highly skilled workers. In this respect the situation of each employer is likely to be somewhat different, requiring special study and specialized treatment.

Manpower

The current manpower problems are of two kinds: how to keep the present labor force; and how to increase the labor force to take care of increased business resulting from the defense program.

As yet, no manpower controls have been promulgated. But that does not mean that employers are not beginning to face problems; and these problems will increase as the labor market tightens. Already the state employment offices have received orders to favor employers with defense contracts. If the manpower situation gets worse, two types of controls are likely to follow. First, employers may be required to do all their hiring through the state employment offices. Second, workers will be required to secure certificates of availability before they can transfer from one job to another.

Some employers are taking defense work even though it may not be overly profitable, so as to establish their positions as defense contractors and thereby protect their labor force and establish their rights to preference for additional manpower. Those who can not secure direct defense contracts are reviewing their customers to determine which of them are doing important defense jobs. They can thereby be recognized as important contributors to the defense effort.

Wages

The recently passed Defense Production Act of 1950 requires that if price controls are imposed, wage controls must be imposed simultaneously. The recent rapid rises in prices and wages appear to make these controls inevitable.

Here, too, some employers remember the difficulties they suffered under the World War II wage control program. Some were frozen with wage rates which prevented them from hiring sorely needed workers in certain job classifications, or they remember losing workers because, under the regulations, they were prevented from giving merit increases or promotions. Wage controls brought many other problems as well.

Many employers are now having their wage structures reviewed. They are having studies made to determine how their wage rates compare with those paid in their communities. They are taking measures to assure that their wage rates will permit them to hire and keep workers under expected conditions. They are having their incentive programs

(Continued on page 110)

Flagstone to Agstone Proves Profitable Move

• All plus 1½-in. stone at the Kitson plant is reduced in this hammermill.

• Left: The quarry truck discharging stone over a feeder at the agstone plant of the Kitson Brothers near Cedar Hill, Mo.

another ON THE SPOT report

WHEN the four Kitson brothers were discharged from the armed forces (two from the Army and two from the Navy) they, like many other young veterans, were short on cash but long on ambition. Before the war two of the brothers had made a nice living selling flagstone mined from a quarry near Cedar Hill, Mo. This business appeared to be a good post-war starting point for all four boys.

The flagstone business soon provided a reasonable income. However, there were large amounts of small stone and spalls in the quarry which were not suitable for flagstone. Looking for a way to get rid of this material profitably, the brothers purchased a small hammermill, offering the hammermill product as agstone. Orders for the agricultural limestone by-product soon outstripped the demand for flagstone; and to take care of this demand the Kitson brothers purchased and installed a Gilson No. 14 hammermill. Later, a Cedarapids 18- by 36-in. jaw crusher with feeder were added to the pulverizing circuit.

In the winter of 1947 the brothers decided to discontinue their flagstone operations and concentrate on the production of agricultural limestone. Accordingly, in that year they cut and sawed logs from their own property and erected wooden storage bins and built a more adequately equipped crushing and screening plant. By cutting and milling their own timber, the boys figured that they saved at least $2,000 in lumber costs in the construction of the bins alone.

Very little overburden has to be stripped off this deposit. The quarry was opened with a 14-ft. bench. It is drilled with jackhammers, using 2¼-in. bits. The holes are spaced 3½ ft. apart with a 4-ft. burden. About 20 holes are shot at one time. To date most of the holes have been loaded with Army surplus composition C dynamite.

Until recently the stone has been loaded by means of a D4 Caterpillar tractor teamed with a Southwest loader. Recently, however, a ¾-cu. yd. Koehring shovel was added to the plant equipment; it is slated to replace the tractor-loader.

Stone is moved from the working face to the plant by a small rear-dump truck and discharged onto the feeder preceding the jaw crusher. Minus 3-in. stone from the crusher is conveyed by belt to a 2-deck Cedarapids 4- by 10-ft. vibrating screen. The oversize, plus 1½-in., off the top

• A view of the work face at the Kitson quarry, with the tractor-loader in operation.

• This ¾-cu. yd. shovel will soon replace the tractor-loader at the pit.

• Below: Two of the Kitson brothers (left to right), Lloyd and Kermit, pose beside their spreader.

deck is chuted to the Gilson hammermill. Two separations are made on the bottom deck — ⅛-in. material, which is sold for lime, and ⅜-in. stone, which is sold for road topping.

Most of the company's agstone product is spread in a company-owned 11-ft. Baughman spreader mounted on a Chevrolet chassis. In this section of the country agstone is sold for $3.10 on a spread basis anywhere within a radius of 15 miles from the plant. The plant has a daily capacity of 700 tons. The four Kitson brothers are Gilbert, Robert, Kermit and Lloyd.

Labor Developments

(*From page* 108)

and their bonus programs examined to see whether they will stand up under expected regulations. They are developing merit rating programs and promotion programs.

During World War II those employers who had well-planned wage structures fared best under wage controls. With wage controls again facing them, many other employers are trying to get themselves into that desirable position.

Dont's

(*From page* 107)

suitably insulated leg wires.

47. Dont use any means other than a blasting galvanometer containing a silver chloride cell for testing electric blasting caps, singly or when connected in a circuit.

48. Don't use damaged leading or connecting wire in blasting circuits.

49. Don't tamper with or change the circuit of a blasting machine in any way for any purpose.

50. Don't spare force or energy in operating a blasting machine.

51. Don't store fuse or fuse lighters in a wet or damp place, or near oil, gasoline, kerosene, distillates, or similar solvents.

52. Don't store fuses near radiators, steam pipes, boilers, or stoves.

53. Don't handle fuse carelessly in cold weather. If possible it should be warmed slightly before using, to avoid cracking the waterproof coat.

54. Don't use short fuse. Cut fuse long enough to extend beyond the collar of the hole and to allow time to retire safely from the blast. Never use less than two feet.

55. Don't cut fuse until you are ready to insert it into a blasting cap. Cut off an inch or two to insure a dry end.

56. Don't cut fuse on a slant. Cut it square across with a clean sharp blade. Seat the fuse lightly against the cap charge and avoid twisting after it is in place.

57. Don't crimp blasting caps to fuse with a knife or with the teeth. Use a standard cap crimper and make sure that the cap is securely fastened to the fuse.

58. Don't use fuse and blasting caps in wet work without having a thoroughly waterproof joint between the fuse and cap.

59. Don't kink fuse in making up primers or in tamping a charge.

60. Don't hold the primer cartridge in the hand when lighting fuse.

61. Don't light fuse in any bore hole until the holes contain sufficient stemming to protect explosives from sparks from the end spit of fuse or a flying match head.

62. Don't try to light fuse with burning paper, other inflammable refuse, or improvised torches.

63. Don't light fuse near blasting caps or any explosives, other than those being used in the blast.

New Methods, Techniques Lengthen Conveyor Belt Life

Research and development in the last ten years has lengthened the service life of both crude and man-made rubbers so that today practically all industrial rubber products are made to higher specifications and wear longer than those manufactured a decade ago. So declares W. L. Smith, technical superintendent, Industrial Products Division of The B. F. Goodrich Company

Today, for example, some conveyor belts outclass their 1940 counterparts by as much as 60 percent on tonnage carried. Ten years ago large coal mining companies expected conveyor belts to carry 25,000,000 tons of coal on certain installations. On such jobs today, belts have a potential of 40,000,000 tons carried. Belts being produced now for conveying hot materials carry 40 percent greater tonnage within the belt life than belts in the same category carried only 10 years ago. Conservative estimates indicate a 100 percent improvement in the service life of oil-resisting conveyor belts during the past decade.

Mr. Smith pointed out that one patented feature, resulting in the grommet multi-V belt, has improved V-belt life by 40 percent. Today's automotive fan belts are 130 percent longer-lived than the 1940 product. According to this expert, longer belt life has resulted from new, stronger fabrics, cord, and fibers used to make the strengthening carcass of belts, and also from the introduction of steel cable cord reinforcement. These developments permit longer belts and higher lift, in the case of conveyor belts.

The average user of industrial products is the one big question mark which might upset the trend toward more effective use of available rubber supplies, Mr. Smith warned. He urged that plant superintendents and foremen be doubly certain that rubber products important to their own production receive proper care and maintenance. Such attention, he said, will conserve rubber by adding years of service to industrial rubber products now in use.

How to Charge Storage Batteries by the Modified Constant Voltage Method

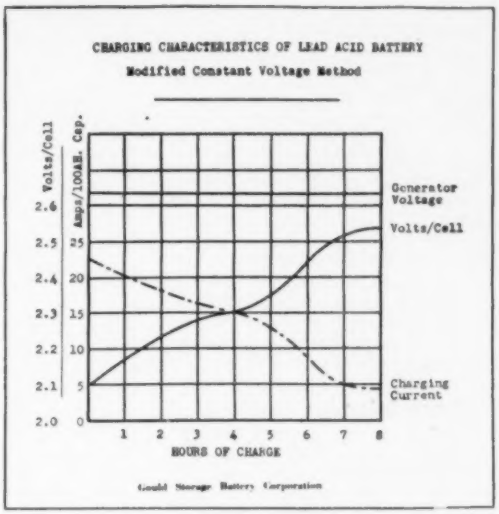
By K. A. VAUGHAN
Manager, Field Engineering
Gould Storage Battery Corporation

THE primary cause of premature storage battery failure is improper charging. It is estimated that industry is currently losing from one-third to one-half its battery capacity due to this factor. And yet charging is simple. In fact, it is almost entirely automatic.

Correct charging requires only that d. c. current be passed through the battery to restore the energy which has been taken from it while performing work. This current is passed through at a rate which will not overheat the battery but which will completely charge it within a reasonable length of time, generally 8 hours. Current is passed through the discharged battery at a high starting rate and tapers off to a low finishing rate as the battery becomes charged.

THE MODIFIED CONSTANT VOLTAGE METHOD

One of the mostly widely used methods of charging industrial-truck and mine-haulage batteries is the modified constant voltage method, which generally employs a constant voltage d. c. generator, although a shunt-wound generator can be used when single batteries are to be charged. When the constant voltage generator is used, a ballast resistor is connected in series with the battery.



• This graph indicates generator voltage, charging current, and volts per cell when charging by the modified constant voltage method.

At the beginning of the charge the batteries are charged at a high starting rate, the rate depending upon how much the batteries have been discharged. As charging continues, the charge rate automatically tapers off, since the battery voltage rises and approaches that of the generator. Approximately the last 20 percent of charge is given at a low finish rate — 5 amperes per 100 ampere-hours of battery capacity. Manufacturers publish recommended finish rates of their batteries, and it is important that these rates are not exceeded. If they are, batteries will overheat, and hydrogen will be given off from the electrolyte. When the battery is fully charged, automatic controls disconnect it from the charging circuit.

Generator Voltage From the characteristics of the lead-acid battery and by experience, it has been determined that the bus voltage for an 8-hour charge should be 2.63 volts per cell. For example, a 15 cell battery requires a 39.5 generator bus voltage. This voltage is a little greater than that theoretically required, but it is used because it furnishes a stable charging current. If a lower voltage were used, the charging current would be subject to considerable variation, with slight changes in charging voltage as the voltage of the battery nears that of the generator.

Generator Ampere Capacity The ampere capacity of the charging generator is determined by the ampere-hour capacity of the battery and the number of batteries to be charged. For each 100 ampere-hours of battery capacity, the generator should be able to deliver 22.5 amperes. Thus, charging equipment to charge a 500 ampere-hour battery should be able to deliver 112.5 amperes.

• Typical form for recording battery charging data. Forms provide case histories, help pinpoint causes of improper charging.

BATTERY RECORD

Day Operator_____ Night Operator _____ Date_____

Battery Number	Charging										Put in Service			Returned			Remarks
	Started					Finished											
	Date	Time	Amps	Temp	S.G.	Date	Time	Amps	Temp	S.G.	Date	Time	Truck No.	Date	Time	S.G.	

Ampere-Hour Meter One method of controlling the charge employs the ampere-hour meter which measures the product of current and time without regard to voltage. In many installations the meter is mounted on the panel board of the charging equipment, each battery having a separate charging panel. It is set to terminate the charge when the ampere-hours required to bring the battery to full charge have been delivered. To determine the ampere-hours required, the specific gravity of a pilot cell is taken before putting the battery on charge, and a chart supplied by the battery manufacturer is consulted to give the correct meter setting for that type of battery at that specific gravity. Once the meter is set, it is not necessary to reset or take any readings except the final specific gravity reading. Another type of ampere-hour meter is mounted on the body of the battery-powered equipment. It registers as the battery discharges and does not have to be set for charging.

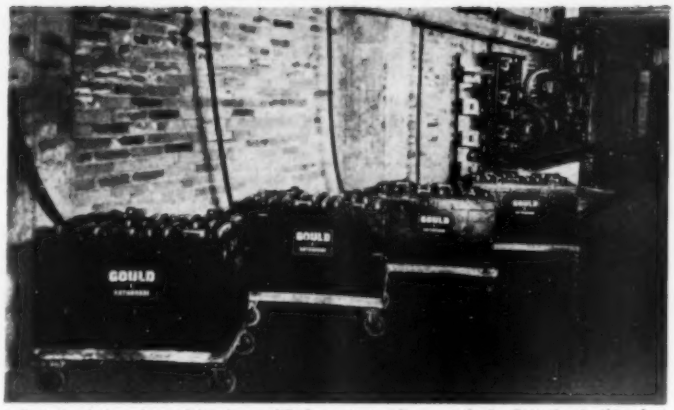
Voltage Relay Timer A second method of regulating or controlling the charge is by means of a voltage relay timer. When this method is used, a relay operates a timer when the battery reaches that state of charge at which the battery starts to gas—2.37 volts per cell at 77 deg. F. The battery is approximately 80 to 85 percent charged at this point. The timer, which has been preset, automatically terminates the charge at the end of the time period. The timer setting is generally 2.5 to 3 hours, although it will be greater for older batteries. When specific gravity readings taken at the end of the charge indicate the battery is not fully charged, the time setter should be increased ½ hour.

IMPORTANCE OF RECORD KEEPING

Of primary importance to correct charging is the keeping of records. Each battery should be numbered, and when it is brought in for charging, the date, time, vehicle number, battery number, specific gravity of a pilot cell, and temperature of a pilot cell should be recorded. This information should also be recorded when the battery is taken off charge.

Thus, a complete record of the battery characteristics is furnished which will indicate whether the battery is being correctly charged. For example, if the specific gravity is less than 1.260-1.280 at the termination of the charge, the battery has been undercharged. If the temperature is about 110 deg. F. the charging rate has been too high. If the records indicate that the battery is being over- or undercharged, the reason can be determined and corrected before work stoppages occur due to battery failure.

When records indicate over- or undercharging, the battery should be checked to make sure that all cells are functioning; charging equipment should be examined to see that it is properly adjusted; and instruments should be tested for accuracy.



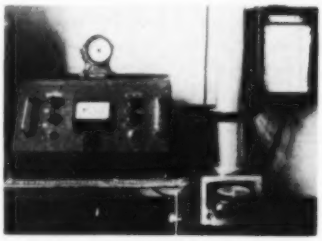
• Batteries being charged by the modified constant voltage method. Batteries in this plant are placed on dollies for safe, easy handling.

The battery room foreman should be thoroughly familiar with storage battery technology and should be acquainted with the key points of charging equipment. Some of the larger battery manufacturers periodically conduct courses on these subjects to which users are invited to send their battery men. Manufacturers also maintain field engineering staffs to help solve problems at the users' plants. It is recommended they be consulted when problems arise; early consultations may result in considerable savings.

Particle Size Distribution Determined by Handy Device

Samuel P. Sadtler and Son, Inc., consulting research laboratories, located at 2100 Arch Street, Philadelphia 3, Pa., have developed a method for the rapid determination of particle size distribution of fine powders. In the past there has been no accurate, non-tedious, reproducible mehod readily available for analyzing 1- to 100-micron particles.

The Sharples Micromerograph used in the Sadtler laboratories operates on the principle of air sedimentation, utilizing Stokes' law for homogeneous fine particles. A powder cloud is formed in the top of the column by firing the sample at a high velocity through a fine adjustable aperture. According to this principle, the large, heavier particles fall more rapidly than the small, lighter ones. The rate of particle accumulation at the bottom of the column is measured by automatically recording, on a chart, the increase in weight on the electronic balance pan at the bottom of the settling cylinder.



• The electronic amplifier and balance and the recorder.

• The chemist (left) starts a run by pushing a button.

Custom-Made Fertilizer

By PAUL N. DOLL
Manager, Missouri Lime Producers Association

• The blending plant used in tests of the Farm Fertilizer Division, L. W. Hayes, Inc., is a revolving barrel mounted on a heavy-duty trailer and powered by a separate power unit. Materials are conveyed into the blended unit by Baughman and Farquhar conveyors. L. W. Hayes is shown shoveling soil nutrient into a conveyor hopper. The blending unit was built by the Hercules Body Company, Galion, O.

A LONG stride, probably the longest in the history of the fertilizer industry, was made during September when the Farm Fertilizer Division, L. W. Hayes, Inc., 4550 Main Street, Kansas City, Mo., started a distinctly new soil nutrition service. This new service got off to a running start at two demonstrations of a mobile agricultural limestone and fertilizer blending and spreading unit.

Missourians and Kansans had ringside seats at these two demonstrations, the first of which was held on the L. W. Hayes farm, one mile west of Paola, Kan., and the other on the fairways of a golf course of the Jefferson City (Mo.) Country Club. Both demonstrations were well attended by farmers, agricultural specialists, fertilizer manufacturers and dealers, and other interested persons numbering about 500. Governor Forrest Smith attended the Missouri demonstration.

During the two meetings agronomists and other agricultural specialists publicly stated their views of this new operation. Their opinions varied considerably, but for the most part were very favorable; they stated that L. W. Hayes, Inc., had taken a step in the right direction, a step that had to be taken in the fertilizer business. Some men declared that this is the right time for this advanced step; others said that it was at least ten years too early for the general acceptance of such a move.

The basis of the Hayes service is that it will apply fertilizers to soil strictly according to a prescription, with one trip over the field. Farmers will pay only for the soil nutrients needed and no more. One trip over a field is a means of saving time, labor, and expense.

The first step in this new fertilizing service is the testing of soil samples for deficiencies in the four major soil nutrients—calcium, phosphorus, nitrogen, and potash. Mr. Hayes says that other soil nutrients will be considered later, especially trace elements, which are rapidly coming to the front as recognized requirements to the health and welfare of livestock and human beings.

After several soil samples have been tested, a prescription is written. If it is found that soil deficiencies are uniform across the field, only one prescription will be written. If soil deficiencies vary across a field, different prescriptions are written for each varying area. All soil testing and prescription writing is performed by a competent agronomist, who makes use of a portable soil-testing kit. All prescriptions are charted on a blackboard in plain view of the blending foreman.

Two prescriptions used in the Missouri demonstration were as follows:

10,400 lbs. agricultural limestone
3,120 lbs. rock phosphate
1,040 lbs. ammonium sulphate
260 lbs. muriate of potash
(This mix shall be spread on area A, 2.7 acres.)

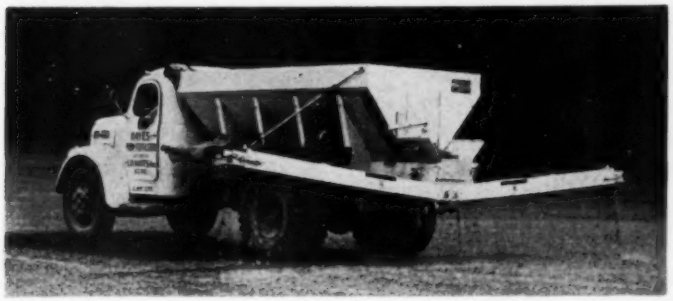
10,000 lbs. agricultural limestone
2,000 lbs. rock phosphate
1,000 lbs. ammonium sulphate
125 lbs. muriate of potash
(This mix shall be spread on area B, 2.3 acres.)

The blending foreman is in charge of the mixing plant—a revolving 20-ton mixing barrel mounted on a heavy-duty trailer. This machine was developed by the Hayes firm and was built by Hercules Body Company, Galion, O. It is the responsibility of the blending crew to convey the prescribed amounts of soil nutrients from storage bins to the blending unit. These materials are loaded by two conveyors—a 32-ft. Farquhar belt conveyor and a 28-ft. Baughman screw conveyor.

After all prescribed soil nutrients are in the blending unit, they are mixed for 16 minutes, during which the direction of rotation is reversed four times. It was found by the Hayes company that a perfect blend is obtained in this manner.

The company supplies its own agricultural limestone if Mr. Hayes is operating his blending service near one of his quarries. Otherwise, he

(Continued on page 115)



• The blended limestone-fertilizer mix is quickly discharged from the revolving mixer into the spreader-bed truck (previously adjusted) and is on its way to the field for immediate spreading. The Hayes company uses Hercules beds.

Industrial Sand Producers

(*From page* 106)

to the fact that Regulation II, establishing defense-order ratings, expressly excludes sand and several other materials which are clearly in the category of natural resources. This regulation, however, is just the first tentative step toward a system of allocations and priorities, and more forthright action seems certain in the near future.

It was pointed out that under the present law price and wage controls must be imposed simultaneously, but that whereas prices could be fixed at levels lower than the May 24 to June 24 period, wages might be frozen at the level prevailing when controls are imposed. Current indications are that selective price controls will be imposed initially, and that the effects will be studied before over-all controls are placed in effect.

A somewhat gloomy picture was outlined in respect to tax increases. Industry's tax load will be increased directly through an excess profits tax, and indirectly through renegotiation of contracts. Taxes on individual incomes seem certain to rise, and there is also discussion of an excess profits tax on individual incomes. These and other measures will be adopted in an effort to place defense expenditures on a pay-as-you-go-basis. Mention was made of the fact that the industrial sand industry is specifically excluded from the peacetime renegotiation act.

Several important points were brought to light in the discussion of the outlook in regard to manpower. Of the nation's present work force of 67,500,000 people, 63,000,000 are now employed. When the goal of 3,500,000 for the armed services is reached, there will be no sizable reserve on which to draw for defense production. In that respect the national economy is not in as favorable a position as it was at the outset of World War II, when there was a large reserve pool of manpower.

It was pointed out that there must inevitably be a sizable shift of manpower away from civilian production as the defense effort gains momentum. Even with this shift it will become necessary, as it did in World War II, to employ many women in industry. Employers are also urged to use handicapped persons wherever possible, and to abandon the practice of arbitrarily retiring workers at age 65.

The prediction was made that armed service requirements will almost certainly exceed the present goal of 3,500,000 men. With induction now under full military control, employers must anticipate that the government will exercise its priority on all able-bodied men in the 18- to 25-year age bracket.

Shaped Blasting Charges To Be Manufactured In Modern Facilities

• Three of the 12 buildings of Shaped Charge Explosives Manufacturers, Inc., Martinsburg, W. Va.

Plant facilities are being completed near Martinsburg, W. Va., to produce the Byers shaped blasting charges* in commercial quantities.

Photographs are shown of four of the twelve buildings: the building where the charges will be assembled and packed, the cafeteria and rest-rooms for the employees, the powerhouse, and the auxiliary storage magazine.

The loading and sealing of the blasting units will be done by a specially-designed packaging machine, with all moving parts actuated by hydraulic power. The capacity of this packaging machine will be from 250 to 400 completed units per hour.

The auxiliary storage magazine is constructed of cinder block, with double walls and double sand-filled roofs. Its capacity is from 50,000 to 100,000 completed units. With this production capacity and facilities for auxiliary storage, the company is prepared at all times to give prompt delivery to its customers.

The location at Martinsburg, W. Va., was chosen because of the fact that it is in the heart of the rock industry of the Eastern states and is in the center of a network of roads and highways leading in all directions. Shipment by rail can also be made over both the Baltimore & Ohio and Pennsylvania Railway systems, the loading points for both railroads being within a short distance of the plant.

The corporation handling the production and sales of the shaped blasting charges for industry's use is known as the Shaped Charge Explosive Manufacturers, Inc., Post Office Box 682, Martinsburg, W. Va. Officials of the company will be glad to answer all inquiries and provide full descriptive data upon request.

• The auxiliary storage magazine has double concrete masonry walls and a sand-filled roof.

*A full description of these charges, together with illustrations of their performance appears on page 79 of this issue.—Editor.

Custom-Made Fertilizer

(*From page* 113)

purchases it from a nearby limestone producer. The other three soil nutrients are supplied by Mr. Hayes and are transported in a large trailer-type truck on which three 6-ton bins are mounted. This bin trailer was developed by the Hayes firm. An ingenious part is a weighing device which accurately measures all material flowing from any of the bins.

After the 16 minutes of blending has elapsed, the batch is discharged into spreading equipment, which has been adjusted to the correct rate of application for the area to be treated. Hercules new-type spreader-bed trucks equipped with chain-fed fertilizer-lime spreaders are used. A significant point in the spreading phase of this service is that the truck operator must know his equipment well enough to make his adjustments prior to loading his truck, and these adjustments must be correct for the area to be treated.

Mr. Hayes was encouraged by the reception given his new service by the persons attending his demonstrations. He was fairly well pleased with the way his equipment functioned. Several bugs have showed up which must be corrected or improved upon, but the Hayes crew expected these, and can make adequate corrections.

One point which probably drew more negative discussion than all others was that too much time apparently was required to convey the soil nutrients into the blending barrel. The bottleneck is expected to be corrected by using larger conveyors or by changing the whole principle of loading to that of a batch loader commonly used in ready-mixed concrete plants. Even though this point received more discussion than any other and the situation was slowed due to the fact that many persons were crowding around the equipment and talking to crew members during the demonstrations, about 60 tons of fertilizing material was blended and spread during a day of demonstration. This is about equivalent to handling and spreading a carload of fertilizing material. Almost any fertilizer dealer realizes that he is doing pretty well if he can deliver and spread a carload of fertilizer in a day.

Accurate cost figures are not available at this time, but the Hayes company will operate on the basis of charging regular retail prices for all materials and will add to material costs a mixing, hauling, and spreading fee. On average land it is expected that this fee will be about $6.00 per acre. This will vary according to the rate of application and the distance the material is transported.

Demand for this type of service is good. Farmers like the idea of taking care of their fertilizing requirements by a one-trip method. They seem to appreciate getting away from the fuss and muss of fertilizer storage on the farm, broken bags, caked fertilizing materials, etc.

Agronomists and other agricultural specialists have expressed concern about chemical reaction between the soil nutrients during the time of blending and before they are applied to the soil. This problem has been given much study, and it is believed by Mr. Hayes and his technicians that it has been solved by the use of raw rock phosphate instead of acidulated types of phosphate. They believe the other ingredients are sufficiently inert and that they will not react chemically with one another in this short time.

This situation, however, has caused the Hayes crew to be particularly careful about leaving these fertilizing materials in the blending unit over night or during a rainy period. The blending unit and the spreading equipment are thoroughly cleaned every day.

More time, thought, energy and inventiveness will have to be expended before this new type of service develops into a smoothly-operated business which will be widely accepted. However, the Fertilizer Division of L. W. Hayes, Inc., has the abilities to get this job done to practical perfection. In fact, the company expects to develop and improve the various phases of service, and also its equipment. Members of the firm believe, however, that the fundamentals of this new soil nutrition service are recognized and have been well covered.

Dangerous Job Well Done By One Man and a Scraper

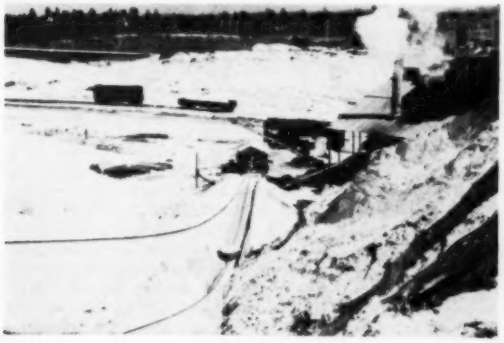
Near Charleston, S. C., the Dixiana Sand Company is mining sand with a ¾-cu. yd. Cresent scraper and a Sauerman roller-bearing scraper hoist. The Crescent pulls the material down from a 50- to 60-ft. bank—a dangerous operation if done by shovels—and carries it to the plant over a 400-ft. span.

The operator brings in 34 cu. yds. an hour on the average haul. The tail-block of the scraper is attached to a simple movable A-frame anchored by a bridle cable along which it is moved to shift the path of operation. At the head end a guyed head-frame supports two single-sheave blocks which guide the operating cables (inhaul and outhaul) onto the drums of the two-drum hoist. "Durolite" blocks are used at the head and tail ends of the machine.

The bucket dumps its loads into a hopper before the head-frame, and a belt conveyor feeds the material to the plant. The machine is operated by one man, who sits beside the hoist in a small frame enclosure beyond the hopper and headframe.

• Left: Looking down toward the Dixiana Sand Company's plant, a scraperful of sand is seen on its way to the dumping station after a 400-ft. ride from the top of the bank.

• Right: The load is dumped at the hopper, to be fed to the conveyor (left) for processing in the plant.



new machinery and supplies

PIT AND QUARRY

● Combination Scraper and Bottom-Dump Wagon

The 2C800 "Heiliner" high-speed scraper and bottom-dump wagon, a product of the Heil Company, Milwaukee, Wis., doubles as a 20-cu. yd. dump wagon and an 18-cu. yd. high-speed scraper.

Highlights among the many features cited by the manufacturer are the following: a highway speed, when loaded, up to 25 m.p.h.; full visibility with the Heil "Hydro-Steer"; ease of operating controls; 200-hp. Cummins diesel engine; extra heavy Heil axle; heavy construction throughout; ease of replacement; 70 percent of overall weight on the tractor drive wheels; application of maximum drawbar pull to cutting edge; heavy-duty clutch and transmission; heavy-duty 4-wheel brakes; ease of turning—a U-turn possible within a radius of 22 ft.; high clearance; fast-opening doors; tire flotation—total ground contact area of 1,820 sq. in. and other advantages.

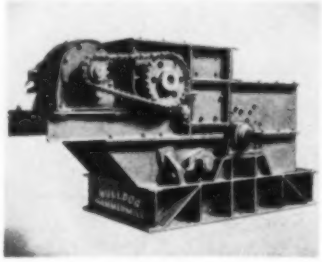
Length of trailer scraper (MS-18), including 2C800 tractor is 39 ft.; width, 133½ in.; weight (scraper and tractor unit), approximately 48,650 lbs. Length of the Model MW-20 trailer bottom-dump wagon, with 2C800 tractor, 34 ft., 4½ in.; width (wagon only), 10 ft. 8½ in.; weight (tractor and wagon), approximately 40,150 lbs.

● Non-Clog Hammermill

C. M. Bindner, president, Hammermills, Inc., a division of Pettibone Mulliken Corporation, Chicago, Ill., has announced the completion of new designs and improvements for the 1951 line of "Bulldog" moving breaker plate hammermills for crushing sticky or high-moisture materials. Accessibility of easily adjusted controls to produce variable size finished products, and heavier shafts with anti-friction bearings are new features.

Through the facilities of the Pettibone Mulliken Corp. laboratories and manganese steel foundry, special analysis steels are used in construction for greater resistance to excessive wear and abrasion. Hammers, liners, breaker plates, and grate bars are said to wear longer, thus reducing maintenance costs with the new machines.

In his announcement, Mr. Bindner claims that the new hammermills, by properly preparing rock, limestone, or similar material for compartment ball or rod mills, can effect as much as a 30 percent increase in capacity, with no increase in power of ball mills. Also that if a plant increases its kiln capacity, it can increase its raw grinding capacity by minor changes and improvements in the secondary hammermills, without major equipment expense. Engineering design incorporated in the new 1951 line may be utilized in hammermills now operating, to accomplish these results.



Hammermills, Inc., division of Pettibone Mulliken Corp., 4766 W. Division Street, Chicago 51, Ill.

● New Forms of Lubricant

To meet especially severe conditions in industrial lubrication, the Lubricants Division of The Lockrey Company, College Point, N. Y., has developed several new forms of its molybdenum-base lubricant.

"Liqui-Moly" is a specially-treated compound of the extremely "greasy" metal molybdenum which is said to attack itself by molecular attraction to metal bearing surfaces, forming a lubricating film which cannot be squeezed out by pressure, and to withstand extremes of temperature without reduction of its lubricating qualities. The Lockrey Company developed a method of incorporating this material in a volatile liquid which transports the metallic lubricant to the bearing surfaces, where the vehicle evaporates and permits the molybdenum to "plate out" on the surface.

Now, because of the demand for a non-volatile form of Liqui-Moly for use where the circulating-cooling effects of a liquid lubricant are required, or where the lubricant is required to remain "wet" under severe conditions, the Lockrey Company offers the first four members of a new "Non-Volatile Series" of Liqui-Moly.

Liqui-Moly NV Regular and Liqui-Moly NV Grease are both incorporated in a liquid glycol derivative having a high viscosity index which will pour at a temperature as low as -25 deg. F.

Liqui-Moly NV Thread Compound reportedly provides a thread lubricant which makes it possible to disassemble any piping or equipment after any period of operation at high temperature or under severe corrosive condition without damage to the equipment.

Moly-Wax-Stix provide a means of applying this molybdenum-base lubricant in solid form. Typical uses include filling grooves cut in bushings or thrust washers, lubricating sliding ways where oil would be objectionable, casting solid lubricant shapes, etc.

B.F.Goodrich

How BFG tires turned coal's top inch from dust to clean profit!

STRIP miners know that cleaning the coal seam after the stripping shovel has finished its job is often a dirty and wasteful operation. Before small shovels can begin removing the coal, the common practice has been to doze away the dirt left by the big shovel with crawler-type tractors. But the steel tracks of such equipment chew up the top inch of coal. This coal, in turn, blows about — leaving a black badge on men, machinery and equipment that represents lost profit.

Here's how the collieries operating the mine shown above turned this top inch of coal into clean profit. The light tractor, equipped with B. F. Goodrich Tractor-Grader Lug Type tires, replaced the heavy dozer. Because these tires have a tread especially designed to give super traction even when working under light equipment, the job was done faster and cleaner . . . without the waste of the top inch of coal. In addition, the superintendent reports that this fast-moving unit makes it possible to work right up next to the huge shovel bucket — saving time, and that means profit.

This is a small, but interesting example of how B. F. Goodrich gives greater service to operators of off-the-road equipment. BFG offers a special tread design for every job to be done. Only BFG has the patented *nylon shock shield*, the exclusive plus factor that practically eliminates bruise breaks that result in time loss and costly replacement. A layer of nylon cord is built in between the tread and body plies to shield the cord body. In tires for heavier service, there is a *double nylon shock shield* to smoothly distribute impacts and strains.

Next time you buy tires, see your B. F. Goodrich dealer. Specify B. F. Goodrich tires for your new equipment and enjoy the profits of longer service and greater traction. *The B.F.Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS
B.F.Goodrich
FIRST IN RUBBER

Cross Section, Automobile tire without tread

Cross Section Malleable Iron Chain Link, conventional design

Cross Section, Automobile tire with tread for longer wear

Cross Section, Beaumont Beaucalloy Chain Link with extra metal (tread) at points of greatest wear.

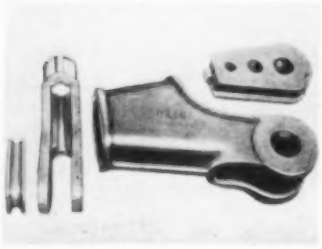
● Newly Designed Chain Link

The new Beaumont "Durated" link, used in Beaumont Beaucalloy elevator chains, is designed and made with additional metal on the side of the barrel which makes contact with the sprocket or traction wheel. The new design can be closely compared to the rubber tread on an automobile tire which is made extra heavy on the surface contacting the road. The Durated link is similarly designed, except that since the barrel does not rotate for more than approximately 30 degrees, the additional metal is necessary only on the contact segment of the barrel. The link is made of Beaucalloy, a heat-treated alloy steel which is hardened to an average of 350 Brinell. Beaumont Birch Company, 1505 Race Street, Philadelphia 2, Pa.

● Dragline Sockets

Wire-rope sockets which are claimed to reduce dragline rope breakage are now being produced by Baer Steel Products, Inc., Auburn, Wash.

The Baer socket and its wedge grip the rope in true-circle seats. Wide shoulders limit pinching, prevent rope distortion and cutting, and keep seats from wearing out of round. The rope reportedly cannot flatten or crush and rarely breaks at the socket.



Socket and wedge seats are matched to the size of rope for which they are specified. Each socket holds a loop of six complete strands. Gripping pressures are limited by the shoulders, so that the rope may flex normally at the socket without breaking and so that pulling and bending stresses are absorbed evenly over the entire wedge and socket seating area. One reversible wedge fits all socket types for each size of rope.

Open and closed end and crowfoot drag sockets come in sizes from ½- to 2¼-in. rope. Available in new, extra tough Fibraloy cast steel.

● Small Steam Turbine

Suitable for conditions requiring smooth, quiet performance and for applications in explosive atmospheres, the model TE-5 "Little Giant" steam turbine can be used for powering shale shakers, pumps, fans, blowers and compressors, according to the manufacturers, the Moon Mfg. Co., Dept. 1A, 128 N. Jefferson St., Chicago 6, Ill. The turbine measures 26 by 16 by 16 in. and can be mounted vertically or horizontally as a closed coupled unit. Special features include grease-sealed bearings, governor valve and control mechanism to provide close speed regulation without hunting, enclosed weatherproof construction, and an overspeed valve to prevent damage should the governor fail. It delivers 5 hp. at 2,000 to 3,600 r.p.m.

● Power-Feed Mountings

Three new power-feed mountings for the Thor drifters rock drills have been announced by Independent Pneumatic Tool Co., 175 State Street, Aurora, Ill. They are all designed for use with Thor Models 82 and 92 drifter rock drills, and are equipped with sliding cones, which it is claimed automatically double the length of feed.

Largest of the new line is the Model RF-96 which has a total extension of 96 in.—48 in. by means of the power feed and 48 in. by means of the sliding cone. Models RF-48 and RF-60, also equipped with the sliding cone, provide feeds of 48 to 60 in.

All three models are powered by air motors which give power-feed operation with the minimum of vibration, the company says.

● Welded-Steel Conveyor Pulley

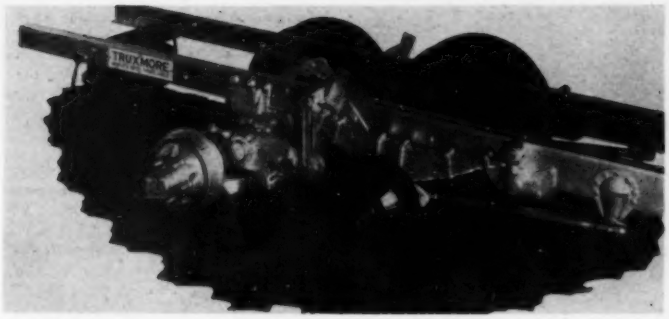
A new line of heavy-duty conveyor pulleys, specifically designed to handle the heavy loads and rough treatment given such equipment in mine and quarry operation, has been announced by the American Pulley Company, 4200 Wissahickon Ave., Philadelphia, Pa.

These pulleys are made with flexible, alloy-steel end discs, welded to all-steel hubs. The flexibility of the alloy-steel end discs is said to be one of the features which give them the ability to withstand shaft deflection caused by high belt tensions and heavy loads. In addition to their greater strength, their lighter weight makes them easier to install and permits lighter supporting structures.

● Geared Variable Speed Motor

For users of fractional horsepower motors, a new design has been developed by U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles, Calif. It combines in one unit a "Varidrive", which permits instant change of speed in a ratio of 1 to 10, and a heavy-duty "Syncrogear" for increasing the torque. It is U. S. Motors' Type VA-GD and is available in ¼, ⅓, ½ and ¾ h.p., with speed ranges from 10 to 10,000 r.p.m.

Since the motor was designed for those fields of operation where a lightweight industrial motor is needed, the frame of the Varidrive is made of cast aluminum. A new type of dial control makes it necessary to turn the handle less than one revolution to obtain any speed change. Slippage is prevented by incorporation of the improved "Autotaut" belt tensioner which automatically compensates for various loads.



● Third Axle

Double the payload in any truck with body up to 26 ft. is one of the many advantages claimed for the new "Truxmore" third axle, manufactured by the Truck Equipment Co., Inc., 1791 Fillmore Avenue, Buffalo, N. Y.

Made in five sizes, it is necessary only to add another set of tires, wheels, brakes, axle and steel beams to double the capacity of a given truck, thus saving the cost of purchasing and operating an additional vehicle, according to the producers of Truxmore.

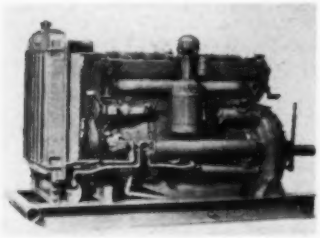
Designed to do away with the damaging effect of road shocks through the use of "Gravity Springs," an exclusive Truxmore patent, the third axle is constructed of high-quality steel, is equipped with large roller bearings, automatic lubrication through large oil reservoirs, and hydraulic or mechanical power-operated brakes to match the truck's system.

Another Truxmore third axle feature is the sliding ball point which enables any one wheel to take 14-in. bumps or holes without lifting other tires off the ground or shifting weight from one axle to another.

● Diesel Improvements

The Murphy Diesel Company, 5307 W. Burnham St., Milwaukee 14, Wis., has recently announced certain refinements in design which are claimed to provide more power, greater economy, greater dependability and longer life than earlier models. At the same time the number of models has been increased. Five 4-cylinder models and six 6-cylinder models ranging in output from 90 to 200 hp. are now available.

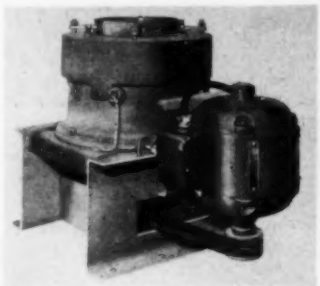
The Murphy principles of "true" diesel operation, plain open combustion chamber, four valves per cylinder, hydraulic servo-type governor, etc., remain as the basis of the design of the engines, the additional power output resulting from improvements in the application of these principles.



● New Reduction Crusher

A laboratory or pilot plant reduction crusher has been designed to reduce ½-in. feed to as fine a product as 10-mesh, single pass.

Developed by Dr. Fahrenwald of the University of Idaho, it is a replacement for more bulky equipment of this type.

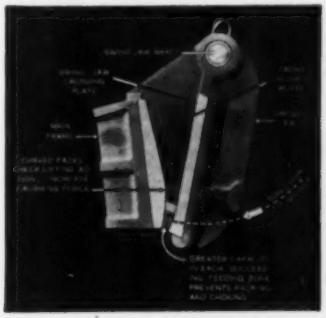


Known as the "Massco Gy-Roll" reduction crusher, it provides a product comparable to that obtained by commercial reduction crushers. The product of this crusher is said to be ideal feed for ball or rod mills, laboratory pulverizers, gravity concentration operations (such as tables, jigs, sink float, or spiral concentration), sizing analysis, and sampling. It is to be manufactured in two sizes, 6 and 10 in. requiring ½ and 1 hp. respectively. The Mine and Smelter Supply Co., P. O. Box 5270, Denver 17, Colo.

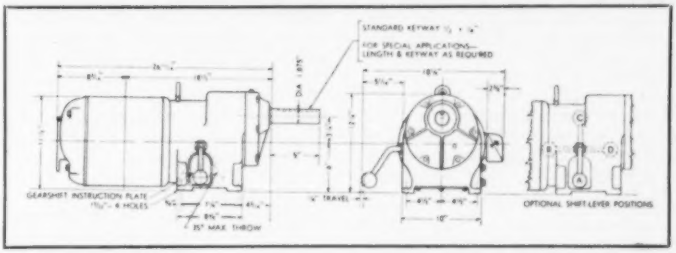
● Curved Crusher Plates

By using a curved surface in a unique type of jaw crusher plate, Traylor Engineering & Manufacturing Company, Allentown, Pa., claims to have cut power costs, reduced percentage of waste fines, and produced a more uniform, cubical aggregate.

The curves over the faces of the plates



are so designed as to give each succeeding zone in the crushing chamber greater capacity than the preceding one, thus allowing free fall of the material as it progresses through the chamber.



● Gearshift Drive

The Lima Electric Motor Company, Lima, O., announces the addition of a new 5-hp. 1200 r.p.m. selective-speed Lima gearshift-drive to their line. This new unit, designated as the Type R3AC, incorporates both primary and secondary gear reductions and is designed individually to motorize and drive machinery of various types that require a low range of selective operating speeds, combined with high radial load capacity.

The Type R3AC Lima drive is a compact combination of a 5-hp. 1200 r.p.m. integrally mounted electric motor and a four-speed sliding gear transmission, having selective primary gear ratios of 4.15, 3.15, 1.85 and 1.00 to 1, and a secondary gear train with optional ratios of 2.25, 2.06, 1.89, 1.74, 1.60, 1.48, 1.36, 1.26, 1.17, 1.08, or 1.00 to 1, providing a choice of output speed combinations from 123 r.p.m. to 1140 r.p.m.

Overall dimensions of the Type R3AC, including standard 5-in. output shaft extension are 31⅛ in. in length, 12¼ in. in height and 18¼ in. in width, including gearshift lever. Type R3AC drives are said to deliver full-rated horsepower in each of the four speeds and both constant-torque; and constant-horsepower two-speed motors are available on these units.

These drives operate on polyphase, a.-c. power supplies of standard frequencies and voltages below 600.

● Folding Ramp

The Martin Machine Company, Kewanee, Ill., has added another development to its line of "Carryhaul" trailers.

This latest development is a patented "Folding Gooseneck" which, when lowered to the ground, forms a loading ramp. The new method of front loading a Carryhaul trailer of low platform height is said to provide greater clearance for viaducts, bridges, and wires, allowing fast and safe movement between jobs.

An additional feature of this trailer is the patented tandem axle assembly which is completely suspended in rubber for flexibility and independent wheel action. This assembly has no grease fittings, requires no lubrication, and has no pins or bushings to be replaced, according to the manufacturer.

When the trailer is loaded, a power-operated winch on the truck-tractor raises the gooseneck to towing position. This trailer will be available in capacities up to 100 tons.

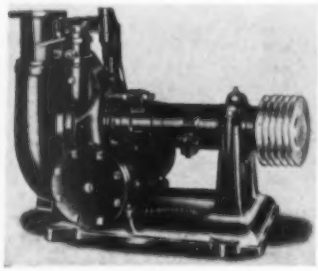
● Sand Pump

A. R. Wilfley and Sons, Inc., Denver, Colo., is now manufacturing a new Model "K" heavy-duty centrifugal sand pump which is designed for higher efficiency and trouble-free operation.

The Model "K" features two-piece frame construction which permits the rubber-lined or special-alloy intake chamber to be replaced readily. A new improved patented diaphragm-type check valve is said to eliminate leakage, give longer check valve life, better bearing protection, and easier removal of valve and associated parts.

Additional popular features include the easy removal of wear parts without disturbing the intake or discharge piping and the ready adjustment of wear parts for maximum efficiency and extended life.

The Wilfley Model "K" Sand Pump



is available in direct-connected, belt-driven and overhead V-belt driven types in 1-, 1½-, 2-, 2½-, 3-, 4-, 5-, 6-, and 8-in. discharge. Rubber-covered wear parts are available for all sizes and are interchangeable with the hard iron parts.

● Car Unloader

The Fairfield Engineering Company, Marion, O., in describing its Model 104B combination belt car unloader, states that it is equipped with a solid rubber belt 18 in. wide, of molded construction, with self-sealing raised edges. Steel cleats join the 16-in. belt sections to form one continuous belt. These cleats also connect the belting to the drag chains.

The 104B is a combination chain-and-belt conveyor. The belt is the carrying medium for abrasive aggregate material,

while the chain and sprockets provide the positive drive. The tendency of belts to break down in the field has been overcome, says the manufacturer, by using a sectional belt, to localize stretching of the chain and shrinkage of the belt in each 16-in. increment.

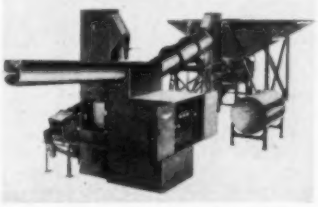
Height of the unloader (over rails) is 4 in. on horizontal section. It is 19 ft. long overall and 28 in. wide overall on horizontal section. The wheel-lowering device, a machined self-locking worm winch, provides 16-in. maximum downward adjustment. The Model 104-B is furnished with steel 36 in. diameter tread with steel cleats, mounted on plain roller bearings, or 6.00x20x6-ply tires and tubes mounted on disc wheels with plain roller bearings.

● Hot-Mix Plant

A new continuous bituminous hot-mix plant is being manufactured by the Wayne Crane Division, American Steel Dredge Company Inc., Fort Wayne, Ind. The M-20, having a 20-t.p.h. capacity, is the first model to go into production.

Known as the "Wayne Monotrol Model M-20," it is designed for one-man control, with all functions electrically operated from a single control panel. The entire plant is built in sections which are easily assembled "on the job" and as easily disassembled for transport. The largest single unit weighs 3000 lbs.

Positive control of the quality of the mix is reported to be the most important feature of the new machine. Accurate proportioning and thorough mixing of the bituminous materials are insured by several patented mechanical devices. An



individually controlled volumetric-type feeder valve for each raw aggregate bin compartment permits accurate proportioning in any specified percentage.

A three-section rotating dryer is said to prevent segregation and eliminate up to 100 percent of the moisture if required. The dryer is equipped with a patented design of baffles, dams, and stops which thoroughly mixes the aggregate as it continually drops from the top of the dryer through the heat. The percentage of moisture content removed can be regulated by the rotating speed of the dryer.

Constant accuracy of the bituminous mixture is maintained by several patented features.

The feed screw of the bin is actuated by a variable speed transmission.

An indicator dial shows the operator the amount of aggregate moving into the pugmill, while an electric-speed control to the bitumen pump permits constant accuracy in mixing any specified proportions. The variable speed transmission permits changing the flow of the aggregate while the machine is in operation.

Thorough coating of the aggregate in the pugmill is insured by the action of a cut-type rotary mixing screw. Additional mixing results from the five-degree elevation of the discharge end, which produces a backward rolling motion as the aggregate travels through the mill.

● Conveyor Belts

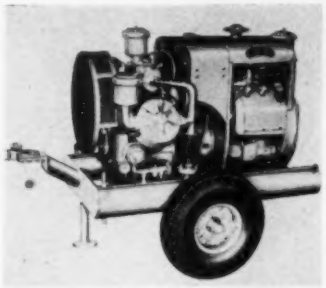
The Republic Rubber Division of the Lee Rubber & Tire Corporation, Youngstown, O., has announced the design of a rubber-covered conveyor belt for use in conveying hot materials.

Made of multiple plies of glass fabric covered with a heat-resistant rubber, the manufacturer claims that the Republic rubber-glass belt removes the early replacement factor from hot-materials-conveying operations in the 400-deg. range. These belt are available in several widths and plies for various applications.

● Compressor

A new 60-c. f. m. compressor which is reputed to be lighter in weight, and more economical than most such machines, is announced by the Davey Compressor Co., Kent, O.

Known as the Davey "Super Chief," Model 60-WBD, the new unit is of the 3-cylinder air-cooled type. An automatic centrifugal clutch engages at 700 r.p.m. to disengage the compressor when the



engine is cranked. A built-in unloader system automatically maintains any predetermined air pressure up to 100 lbs. The compressor's 6-in. diameter tubular steel frame serves as a 2,500-cu. in. capacity air receiver. The manufacturer states that the unit will operate efficiently in a temperature range of —65 to +135 deg. F.

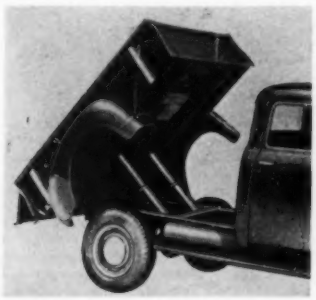
The Super Chief is powered by a Model VP-4, 4-cylinder air-cooled Wisconsin engine. It is 72-in. long, 48-in. wide, and 52-in. high. Net weight is 1,250 lbs.

● Dump-Conversion

The Hercules Steel Products Corporation, Galion, O., has introduced a new pick-up dump conversion, called the "Tipster".

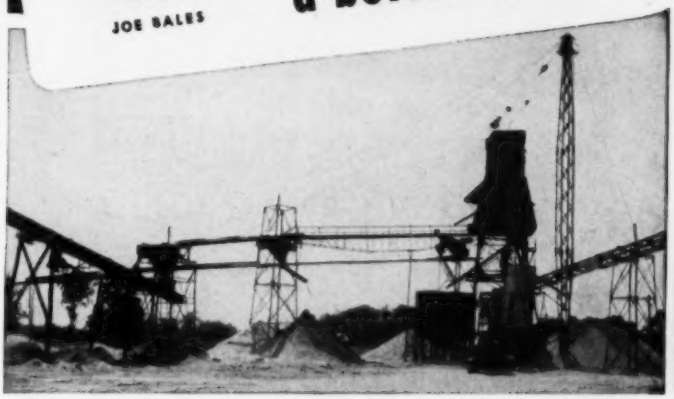
The new accessory, an engine-driven, low-mount unit, converts ½-ton, ¾-ton, and 1-ton pickups into dump trucks. The main elements are: "Hydra-Clutch" pump, a clutch-type hydraulic pump, fan-belt powered, operated only when dumping; steel understructure for mounting under the pickup body; and twin cylinder hydraulic hoist rams.

Shipped as an entire unit, the Hercules pick-up "Tipster" includes the Hydra-Clutch pump, twin rams, steel understructure, oil tank, fan belt, hydraulic hose, mounting brackets, and dashboard control. The complete accessory weighs approximately 400 lbs.



JOE BALES

300 Yards a Day for 3½ Years... "I couldn't want a better screen."



LIKE many widely experienced men in the aggregates business, Joe Bales has used a number of different screens, but the one he is using *now* at the Bluff Road Sand and Gravel Company, Indianapolis, Indiana, is a Deister Vibrating Screen.

"In 3½ years of operation, *we've never had any trouble with this Deister Screen,*" says Mr. Bales.

"And the screen sure handles the load. To produce 300 yards a day, we often must get 1 yard a minute from this screen. I can say that it is really built . . . and really good. In fact, I couldn't want a better screen."

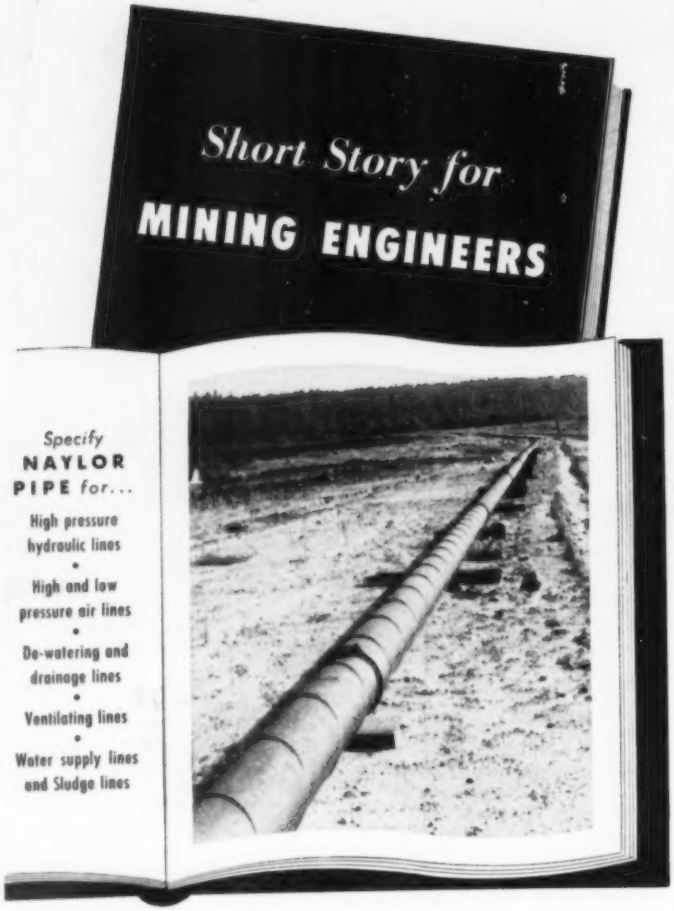
The Deister employed at Bluff Road is a triple-deck 3′ x 8′ unit, sizing 1½″ L gravel, ¾″ gravel, and ¼″ concrete sand. This unit, like all Deister Vibrating Screens, has an exclusive, elliptical throw with vigorous, positive action for fast accurate sizing. It is ruggedly built, with simple, oil bath lubricated two-bearing construction for long, trouble-free service.

It is the kind of screen that operators like Joe Bales say will "put more profit in your business." Why not get all the facts on Deister Vibrating Screens for your operation? Just ask for a copy of Bulletin No. 50 which shows you how to specify the proper vibrating screen for your requirements.

DEISTER SCREENS

DEISTER MACHINE CO.

FORT WAYNE 4, INDIANA



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is ideal for mining service because it's LIGHT in weight... yet HEAVY on performance

Sizes from 4 to 30 inches in diameter and thicknesses from 14 to 7 gauge. All types of connections, fittings and fabrications. Write for complete details.

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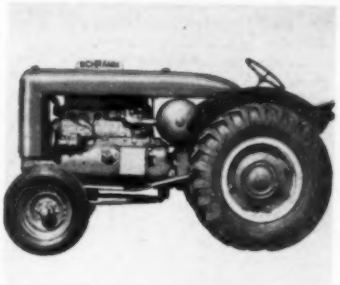
1257 East 92nd Street, Chicago 19, Illinois
New York Office: 350 Madison Avenue, New York 17, N. Y.

● Hole-Cleaning Drill

The Syntron Company, 385 Carson Ave., Homer City, Pa., announces the new self-rotating, hole cleaning gasoline hammer rock drill. In this new drill the rotation of the hollow drill steel and bit

is accomplished by the orthodox method of using a spirally-splined piston and ratchet.

Exhaust gas is forced through the hollow drill steel to blow the cuttings out of the hole, down to a depth of approximately 24 in. For deep hole drilling, down to 8 or 10 ft., an auxiliary gas engine-driven blower is hose-connected to the hammer to boost the pressure through the hollow drill steel.

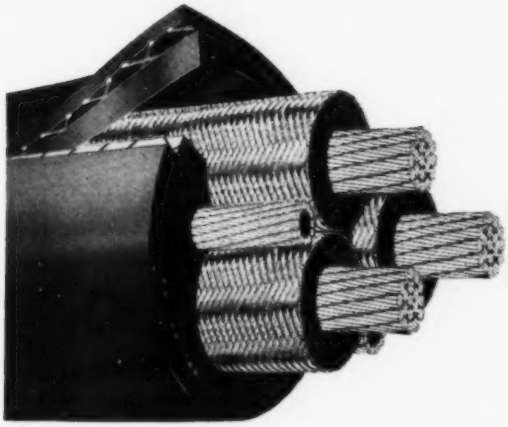


Offered in two models, the "Pneumatractor" tractor-compressor combination, made by Schramm Inc., West Chester, Pa., is equipped with a standard model 60 "Unistage" or 105 "Pneumapower" compressor. Wheelbase is 71½ in. and overall length is 117 in. A complete set of accessories is obtainable. They include front-end loaders, snow plows, backfill blades, front and rear winches, post-hole diggers, "Pneumajack," paving breakers, and rotary brushes.

It's Butyl-Insulated!

SECURITYFLEX type SHD

Better for your high-voltage, heavy-duty big shovel jobs!



The newly improved Securityflex* Type SHD is better because it's BUTYL-INSULATED for superior electrical and mechanical characteristics. It stands up better under compression and mechanical abuse, has increased moisture resistance and much higher heat resistance (rated at 80°C.).

Better because it has a new "copper-cotton" combination shield that

means faster, easier splicing
eliminates chafing failures

Better because the patented grounding wires are rubber-cored. That means grounding wires that

will not kink
have larger diameter for greater contact with conductor shield
provide cushioned construction that won't cut insulation

It all adds up to a much more rugged shovel cable. For more information on Securityflex Type SHD, get in touch with your nearest Anaconda Sales Office or Anaconda Distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York. 50514

*Reg. U. S. Pat. Off.

the right cable for the job ANACONDA® WIRE AND CABLE

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are designed to take a beating—that's why they're specified by manufacturers who build earth-moving equipment that lasts!

SPECIFIED ON THE JOB!

Men who operate bulldozers—cats—shovels—know they can get the tough jobs done when they're running machines equipped with J-M INDUSTRIAL FRICTION MATERIALS

• Digging a canal—stripping a mine—cutting a road—Johns-Manville Friction Materials move more tons of earth than any other industrial brake or clutch frictions. That's because they've built a reputation for handling bigger loads at high speeds—*at lower cost!* Send for your copy of "Johns-Manville Industrial Friction Materials" that tells how these materials combine maximum operational efficiency with long life and low-cost maintenance. Write Johns-Manville, New York 16, N. Y.

JM

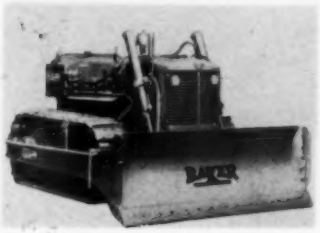
Johns-Manville

INDUSTRIAL FRICTION MATERIALS

No. 1 With Leading Manufacturers

• Bulldozers

A complete new line of Baker bulldozers and gradebuilders for Allis-Chalmers HD-5 tractors has been placed in production by Baker Mfg. Co., Springfield, Ill. These have hydraulic control through twin hydraulic cylinders mounted at the front of the engine frame.



Both the bulldozer and the gradebuilder are mounted close to the radiator to maintain tractor balance and stability and utilize the full power of the HD-5 tractor, according to the Baker Co. Both bulldozer and gradebuilder are available for standard and wide-gauge Allis-Chalmers HD-5 tractors.

• Lightweight Diesel

A new, compact, lightweight diesel engine, now being manufactured by the Detroit Diesel Engine Division of General Motors Corp., 13400 W. Outer Drive, Detroit, Mich., promises the economy and efficiency of diesel power in scores of applications where such power could not be used before because of size and weight. The new engine, designated the "110" because of its 110-cu. in. displacement per cylinder, is a 6-cylinder 2-cycle unit rated at 275 hp.

Some of its features include blower scavenging with a new and highly efficient gear-driven centrifugal blower furnishing considerably more air for the cylinders than is needed for combustion. Location of the blower at the rear of the engine above the flywheel not only offers the best possible connection to the main gear train, but also contributes to compactness. A spiral air inlet helps maintain its high efficiency.

GM unit injectors (one for each cylinder) pump, meter and atomize the fuel, and are easily removed for inspection or exchange.

Cylinder block and head are one-piece castings, both being symmetrical

BEARS FOR WEAR-MISERS FOR MAINTENANCE

QUAKER CONVEYOR BELTING

. . . for top-notch performance at rock-bottom cost

Here's one belt that is built for the toughest materials handling job. A Quaker Conveyor Belt lifted well over one million tons of rock during an eleven year period with minimum wear!

That's because Quaker Conveyor Belts are built to trough better . . . resist cuts, gouges, and the effects of acid materials and mildew . . . withstand the shocks of loading. These belts are scientifically made of ply upon ply of strong, specially woven cotton duck tightly bonded together to prevent internal friction while flexing. Resilient, long-lasting live rubber gives covers extra stamina. Precision controlled vulcanization moulds plies and covering into a belt that carries maximum tonnages at minimum costs.

Whether your needs are Conveyor Belting for hauling rocks, sand, gravel or aggregates . . . or flat transmission belts, V-belts . . . Quaker has a performance-proved belt that will do the job at rock bottom cost. See your Quaker distributor, or write us today for the full details.

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There's a Quaker Hose for every use in the Rock Products Industry—for suction pumps, stripping jobs, pneumatic tools, water lines, rock drills, and other types of service.

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V-Belts or Flat Belts, Quaker has the one to fit the drive . . . to transmit maximum horsepower at the lowest operating cost—all pre-tested for peak performance.

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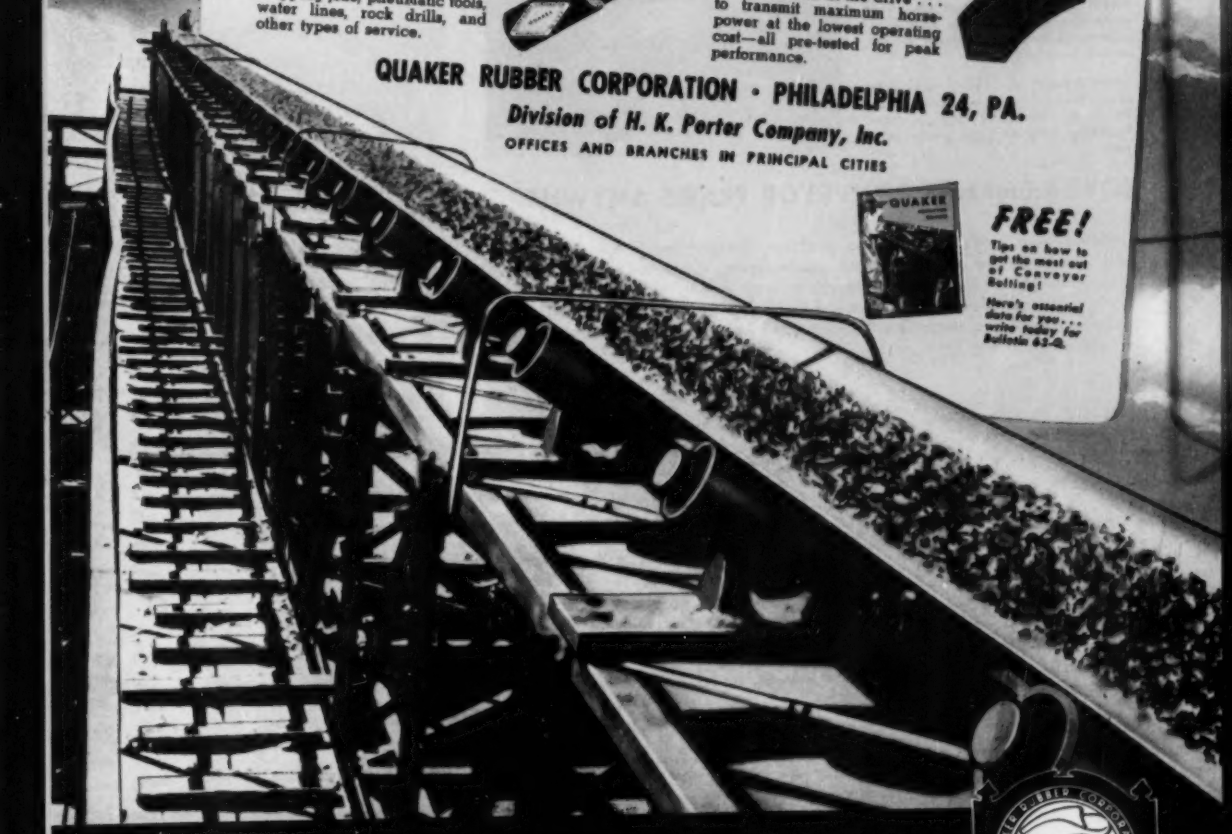

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Baughman

The HI-SPEED Belt and Bucket Elevator that costs less to own and cuts your operating expense

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Built by production line methods to slash manufacturing costs! Standard length sections and head and boot assemblies are adaptable to the requirements of any permanent or temporary installation.

Large capacity . . . heavy duty. Lifts sand, gravel, other aggregates from 20' to 80'—up to 90 tons per hour. Ruggedly built of high tensile alloy steel.

MOVE *Baughman* CONVEYOR TEAMS ANYWHERE!

Whatever your materials handling problem, BAUGHMAN has the answer. There are unlimited variations and combinations possible in BAUGHMAN equipment — horizontal belt conveyors to any length . . . heavy duty, light duty and inclined elevators . . . auger type and belt type conveyors adjustable to any angle. All equipment is either completely portable or easily disassembled for re-location at any time.

MODEL Q AUGER CONVEYOR

Loads, unloads, conveys any material that becomes fluid in movement . . . from the horizontal to 60°. Volumes from 15 to 50 cu. ft. per minute depending on material conveyed. Positive direct drive. For portable or stationary installations. Available with or without wheels . . . with hopper or in combination.

MODEL 230 BELT CONVEYOR

Another "Hi-speed" product that's long on service and short on price. Pre-fabricated by assembly line methods . . . assembled from standardized units. Result: a ruggedly built conveyor you can well afford to buy. Conveyor illustrated is 30' long, composed of one 20' section, one 7' tail and one 3' head section, from stock. Gasoline or electric power. Portable or stationary.

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about a vertical plane between the No. 3 and 4 cylinders. This symmetry allows the cylinder head and block to be reversed, giving a choice of rotational directions and making possible a variety of accessory locations to suit installation requirements.

The 110 is offered as a bare engine, with full equipment for marine or industrial use, or with special accessory arrangements for a variety of end products. Optional accessories, which may be powered directly from the gear train, include a hydraulic steering pump, an air compressor, and a pump to circulate oil through a General Motors torque converter. The converter is designed specifically for the engine and installed as an integral unit at the factory for those applications where a fluid drive is advantageous. The General Motors hydraulic reverse and reduction gear is also available for marine applications.

● Booster Clutch

A new mechanical booster clutch that is said to reduce lever pull more than 50 percent for the operator has been developed by Koehring Co., Milwaukee, Wis., for use on the Model 304 Koehring ¾-cu. yd. excavator. This reduction in operating effort is made possible because

the clutch is designed with two separate load-carrying clutch bands, one of which helps to set the other.

The new booster clutch helps the operator retain a good "feel" of the load because the lever pull is directly in proportion to the pull produced by the clutch. Production increases which have been noted can be attributed to the introduction of a heat compensator spring that changes tension automatically. Full clutch efficiency is maintained at all times thereby, and any time losses for manual clutch adjustments are eliminated.

In addition, the heat compensator spring is a means for controlling the amount of power transmitted by the clutch to fit all applications and varying requirements for shovel, dragline, clamshell, crane or hoe work.

● Electric Chain Hoists

A complete and improved line of Whiting electric roller-chain hoists has been announced by the Whiting Corp., Harvey, Ill. The redesigned hoist retains the simple, totally enclosed, double worm-

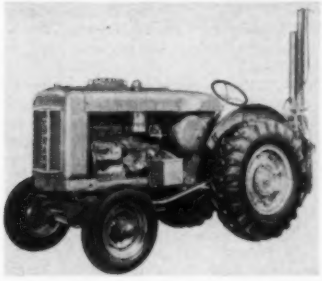
gear drive of previous models. However, many parts have been simplified and strengthened. The hoists use a spring-set, shoe-type motor brake, in which the

lining is bonded to the shoe. This arrangement is said to provide larger braking power and longer life.

The pull cord has been relocated at the center of the hoist frame to eliminate any tendency of the hoist to tip when the control cord is pulled. The hoist control switch also is relocated and protected from damage by a new switch mounting. The switch wiring is readily accessible by removing the hoist name-plate.

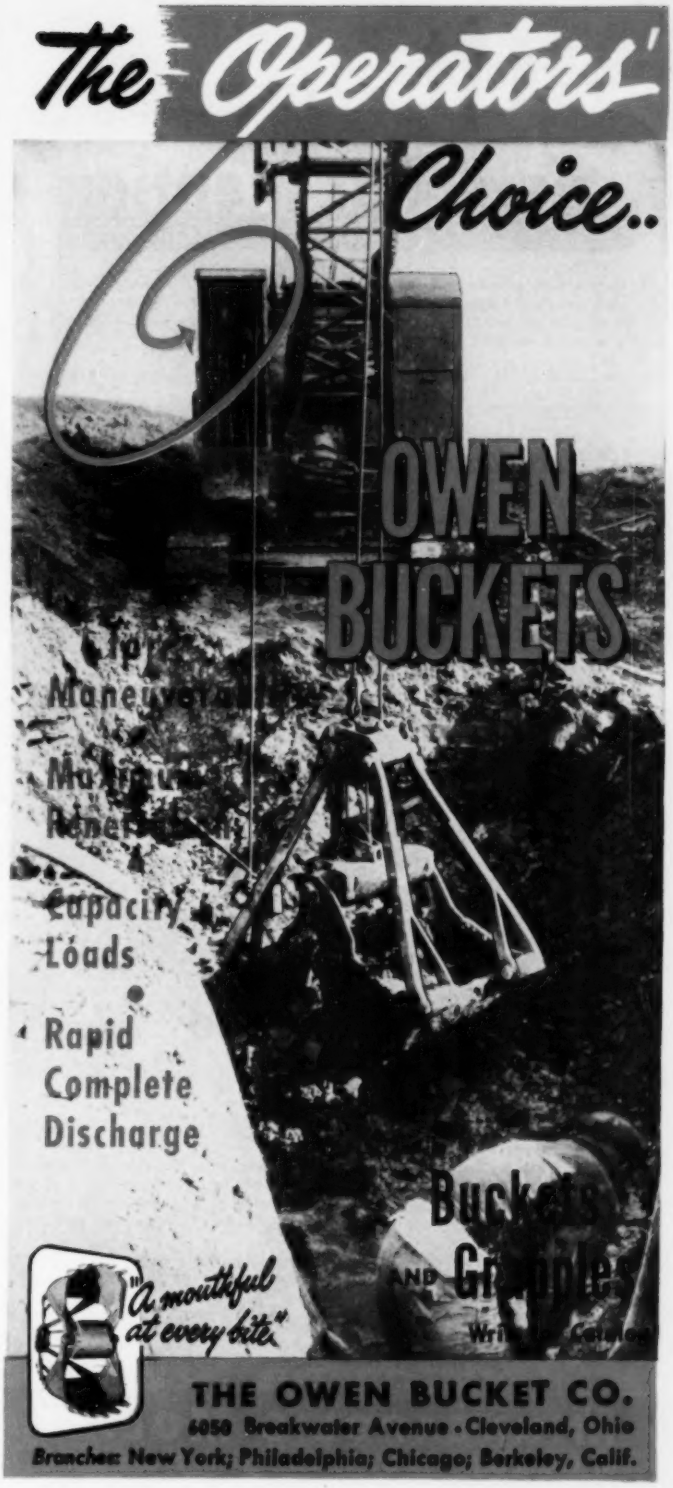
● Pneumatic Tractor Jack

The Schramm "Pneumajack" consists of a pneumatic cylinder mounted on a vertical column at the rear of the "Pneumatractor" with a D-55 or D-45 Schramm rock drill mounted on the piston rod of



the pneumatic cylinder. The drill has 36-in. movement making 24-in. drill changes easy. It is recommended for production drilling in quarries, road building, excavating, grouting, and many other purposes.

The Pneumajack can also be furnished with two BT-32 backfill tampers or a B-80 paving breaker, mounted on air feed and lift. The tools listed all use the same basic air cylinder that feeds and lifts them. Tools can be removed and used as hand-held tools. With a proper adapter, they can be used separately on one air cylinder. Schramm, Inc., West Chester, Pa.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personal mention

D. W. KELLEY, president of the Arizona Sand and Rock Company, Phoenix, Ariz., is the new president of the Arizona chapter of the Associated General Contractors of America. Other officers are L. G. VINSON, Vinson Construction Company, vice-president; R. M. MAKEMSON, Wallace & Wallace Construction Company, secretary and director; and JOSEPH CONDREY, who was appointed secretary for the 16th year.

T. C. BUTLER JR., chief engineer at the Simplot Fertilizer Company since 1946, has opened offices in the Continental Bank Building in Boise, Idaho. He will act as a consulting engineer in mining and general engineering.

W. F. WISE, president of the Southwest Stone Company of Dallas, Tex., has been named a member of a conservation committee by the National Association of Manufacturers.

FRANCIS E. MURPHY has been appointed production supervisor of the Wyandotte works of the Pennsylvania Salt Manufacturing Company. In this capacity, Mr. Murphy will be in active charge of all Pennsalt's chemical plant operations in Wyandotte and will report to H. J. Eichenhofer, assistant superintendent.

Mr. Murphy joined Pennsalt in 1943 as assistant to the manager of research and development. In 1945 he was transferred to Pennsalt's Whitemarch Research Laboratories as director of development, and in 1947 came into the manufacturing division as assistant production manager. Later he became supervisor of process controls, the position he held before being appointed to Wyandotte.

It was also announced that JOHN BOGEN, formerly with Pennsalt's production department in Philadelphia and the staff at the Calvert City, Ky., plant, has been transferred to Wyandotte.

DEAN R. GIBNEY has been appointed sales manager for the United States Potash Company, and J. B. FORD has been named assistant treasurer.

At the annual election of the Casey Stone Company, Liberty, Ky., three new board members, GEORGE GARNER, EDGAR MURPHY and FRED PORTER were elected.

At a recent meeting of the board of directors of the Northwestern Portland Cement Company, Seattle, Wash., GORDON TONGUE, former vice-president and general manager of the company was elected president to succeed C. T. W. HOLLISTER, who recently resigned after 18 years of service in that capacity.

Mr. Tongue, who has over 35 years of experience in the cement industry, will also replace the late Major Harry K. Metcalf on the board of directors. Mr. Hollister will continue as a member of the board and chairman of the executive council.

WALTER H. WULF, president of the Monarch Cement Company, Humboldt, Kan., was recently named a member of the board of directors of Eastern Kansas Utilities, Inc.

RALPH H. CAMPBELL was elected vice-president in charge of white cement for the Medusa Portland Cement Company, Cleveland, O., according to announcement released by the firm's officials on June 22, 1950.

★ Modern pit methods call for *Easy Handling MM Industrial Wheelers.* The new 27 and 49 h. p. heavy duty models are large capacity . . . can go anywhere . . . speeds up to 14.5 m.p.h. Operators save time with quality MM Industrial Wheelers . . . *built for dependability, ruggedness and easy maneuverability.*

A wide variety of attachments enable owners of MM Industrial Wheelers to do the work where larger and less maneuverable machines fail . . . *and do it at lower cost.*

MM Industrial Power Units for crushers, conveyors, pumps and screens are available from 25 to 230 h. p.

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obituaries

GEORGE W. HINKLEY, a Lawrence Portland Cement Company sales representative in Maine since 1929, died at the Augusta General Hospital on July 12 of a coronary thrombosis. He was 62 years old.

CHARLES W. MAXWELL, 52, president of the Albany Gravel Company and the Ready Mix Concrete and Supply Corporation, died on August 21 in Albany, N.Y.

When he first came to the Albany area, Mr. Maxwell was associated with the Richard Hopkins Company, later leaving to become one of the founders and first secretary of the gravel concern. Mr. Maxwell was a former president of the New York State Chapter, Associated General Contractors of America and a former director of the First Trust Company of Albany.

FRED CODA, 55, an employee of the Universal Atlas Cement Company at Independence, Kan., for 25 years, died on September 4 of a heart ailment. He had been in poor health for some time.

WILLIAM A. HARBISON, son of Samuel F. Harbison, the founder of the Harbison-Walker Refractories Company, died recently in Hanover, N. H., at the age of 75 years.

GEORGE B. THOMAS, sales promotion head of the Gray-Knox Marble Company, Knoxville, Tenn., and the Bloomington Limestone Company, Bloomington, Ind., died on August 13 in Murrysville, Pa., while visiting this city on business.

CLYDE D. MCKINNEY, an employee of the Diamond Cement Company of Seattle, Wash., for 21 years, died at his home in that city on September 10 after a lingering illness. He was 61 years of age.

JOHN F. MCMAHON, managing director of the Industrial Hygiene Foundation at the Mellon Institute in Pittsburgh, Pa., died unexpectedly in his office on September 15. At the time of his death Mr. McMahon was in his 14th year as a member of the institute and his 8th as managing director of the Industrial Hygiene Foundation. He was 47 years of age.

CLARENCE W. SNYDER, office manager of the Certain-Teed Products Corp., Buffalo, N. Y., died on October 3 after an illness of seven months. Mr. Snyder was 56 years of age.

DR. M. F. COOLBAUGH, president of the Colorado School of Mines for 20 years, died in a Denver hospital on September 9 from a heart attack. Dr. Coolbaugh retired from his duties as president of the mines school in 1946 after a lifetime of teaching, research, and scientific service. In 1947 he accepted President Truman's personal invitation to serve on the Committee of Nineteen, the group which outlined the Marshall Plan.

JAMES B. SPEAR, associated for 35 years with the sand and gravel industry in Indianapolis, and for the last five years with the American Aggregates Company, died September 24.

Starting his career as a bookkeeper for the Stevens Gravel Company, Mr. Spear subsequently became part owner of the Capitol City Gravel Company. He also had served as plant manager of the Kelly Sand & Gravel Company, and in the sales department of the Brown-Huffstetter Co.

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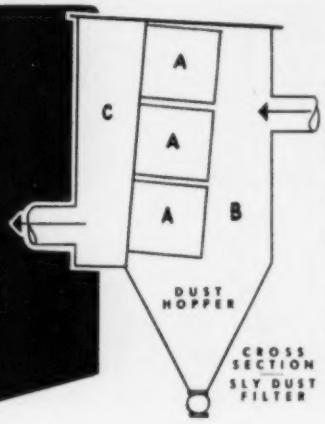

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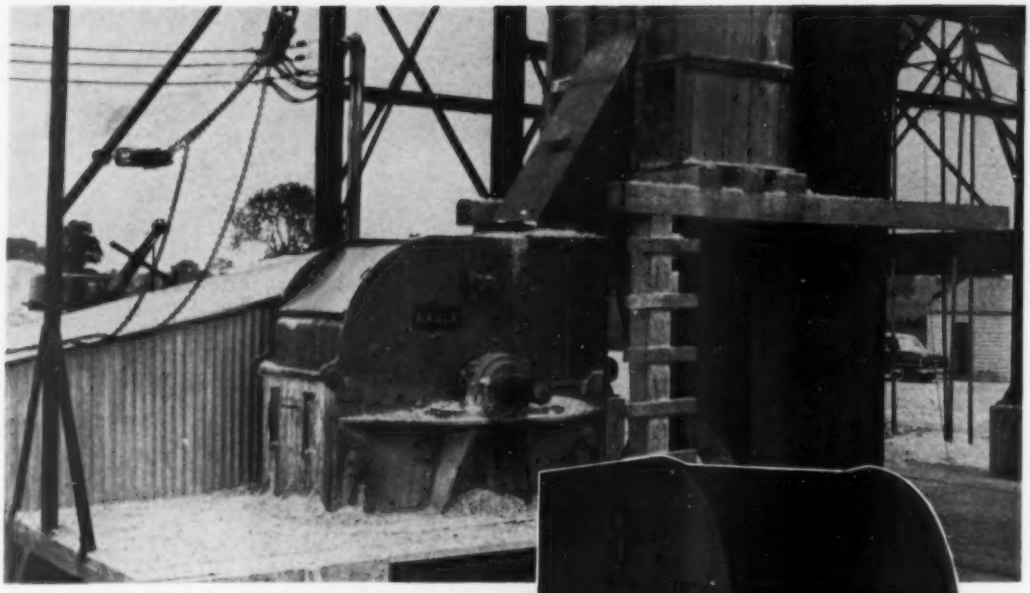

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This newest hammermill-pulverizer is designed to do that larger, heavier job. Makes quick work of limestone or any stone up to 3", at the rate of 100 to 250 tons per hour.

The consistently high quality and cubical shape of EAGLE processed limestone is the talk of the "quarry-town". In many cases it eliminates the need for a primary crusher.

SKF spherical, roller type, self-aligning bearings are typical of the quality throughout. Adjustments easily made on grate bars and breaker plates while machine is in operation.

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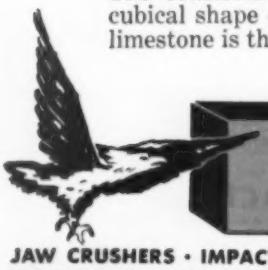

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1. Ready-Flow Bulk Cement Handling System. 6-page folder with postage-free card attached. Presents by means of detailed description sketches and photographs full information on these systems, designed for trouble-free and economical operation. W. S. Nott Co.

2. Hi-Up Worthington-Ransome Truck Mixers and Agitators. (Bulletin No. R-1700-B3) Describes five mixers and includes specifications, line drawings, and illustrations of three sizes. Pictures and describes important parts of these units and discusses manufacturing techniques. Worthington Pump and Machinery Corporation.

3. Fairfield Belt Car Unloader. Bulletin No. 750 gives features and condensed specifications of this 60- to 80-cu. yd. per hr. capacity belt unloader for bottom-dump railroad cars. The Fairfield Engineering Co.

4. Eagle Sand Gravel and Washing Equipment. A 36-page loose leaf brochure describing equipment for washing, classifying, and dehydrating. It includes shale removers, trash remover tub ends, motor mounts and drives, sand tanks, and a gallonage chart. Illustrated with many photographs and drawings. Eagle Iron Works.

5. Diamond Screens and Washers; Diamond Belt Conveyors, Conveyor Rolls, and Bucket Elevators; Diamond Feeders and Bins. These three bulletins describe in technical detail the general features and specifications of this equipment, and include many photographs, drawings, and tables. Diamond Iron Works, Inc.

6. Truck-Man; 3 Models Do 4 out of 5 Material Handling Jobs. Complete features and specifications of the Model D, 3500-lb. skid lift; Model DF, 3,000-lb. pallet toter; and the Model DT, platform utility, are included in this well-illustrated 8-page bulletin. Truck-man Division of the Knickerbocker Co.

7. Denver Adjustable Stroke Diaphragm Pumps. (Bulletin P8-B7) Features and specifications of 1 to 6 in. sizes; simplex, duplex, tripiex, and quadriplex types are covered in detail. Denver Equipment Co.

8. Brom Abrasion-Resistant Castings. This 4-page brochure along with 4 inserts explains the advantages and features of these abrasion-resisting Ni-Hard alloy white cast irons. Various applications and testimonials are included. The Brom Machine & Foundry Co.

9. Dependable. A 4-page brochure describing the types of Multi-Wall bags available from this company, Kraft Bag Corp.

10. Acker Rotary Core Drills. (Bulletin 21) Describes the general design features and the individual specifications of five models of core drills, and of a heavy duty winch for jetting and pile driving. Acker Drill Co.

11. Hydrocal Pump-Maximix Rubber Protected. Catalog No. 850 includes information on design features, operating applications, and data on calculating pump requirements for a given job. Many tables, cutaway views, drawings and photos. Includes a list of branches, representatives and agencies carrying these products. The Allen-Sherman-Hoff Co.

12. The Heilliner. (Bulletin RM-50008) Full color 8-page brochure describes this prime mover with its interchangeable scraper and bottom dump wagon. Includes information on the patented Hydro-Steer and Super-Axle and on the Cummins 200-hp. Diesel engine which powers the unit. Features job pictures, cutaway views, and complete specifications. The Heil Co.

13. Wilfley Centrifugal Sand Pumps; The New Model K. Catalog No. 200 includes information and technical data on this concern's line of sand pumps. In addition, includes data sheets which may be filled out and sent to the company to obtain detailed recommendations for specific pump applications. A. R. Wilfley & Sons, Inc.

14. Liqui-Moly. Technical Bulletins No. 21D and 21E describe the interesting properties, composition, and various applications of this molybdenum base lubricant which is available as a liquid, a grease, and in solid forms. The Lockrey Company.

15. Anchor Hydraulic Hose Assemblies and Couplings. Describes various types of high-, medium-, and low-pressure hydraulic hose fittings. Contains a good deal of engineering information on the use of such fittings. Anchor Coupling Co.

16. Sauerman Long Range Machines. Illustrated flier describing some applications of power scrapers and cableways for storing, reclaiming, and excavating. Sauerman Bros. Inc.

17. Brown Air-o-Line Differential Controllers for Flow and Liquid Level. Catalog No. 2221, 48 pages, contains many pictures, drawings, tables, and cutaway views to describe the various applications and technical features of these control and recording devices. Complete specifications of this equipment are included. The Brown Instrument Co., division of Minneapolis-Honeywell Regulator Co.

18. Heavy-Duty Semi-Trailers. Bulletin No. 1249 gives features and applications of these 12- to 56-cu. yd. capacity steel or aluminum trailers fitted with automatic drop bottom, clamshell, or cable-operated discharge doors. United Iron Works Co.

19. Link-Belt Worm Gear Drives. (Book No. 2824) This 80-page book illustrates, describes and tabulates three basic types of gear drives, each available in 10 dif-

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ferent sizes, for fractional horsepower or large horsepower, and in speed ratios of 3½:1 up to 8000:1. There is also a section on typical drive problems and their solution. Link-Belt Co.

20. 3 Things You've Always Wanted in a Centrifugal Pump Now Available in the New DeLaval G8 Pumps. Describes the factory exchange plan, elimination of stuffing box trouble, and elimination of all lubrication, in addition to design and operating features. DeLaval Steam Turbine Co.

21. GMC Diesel Truck Quiz. A pocket-sized pamphlet, written in the form of a quiz, answers many questions about diesel engine design and operation. GMC Truck & Coach Division, General Motors Corp.

22. 10-Ton Model UD Rear-Dump Euclid. (Form No. 151) Describes in detail the smallest off-highway hauling unit made by this company. Euclid Road Machinery Co.

23. Cedarapids Double Impeller Impact Breaker. 8-page bulletin describing construction features, dimensions, and specifications. Includes information to show how this impact breaker achieves high-capacity production of cubical-shaped aggregate. Iowa Manufacturing Co.

24. Tisco Manganese Steel Chain. Bulletin 150 describes construction features and applications of this 12½ percent manganese steel chain for conveyors, elevators, drives, etc. Taylor-Wharton Iron and Steel Co.

25. Jones K1.22, 2½-Ton Mobile Crane. (Catalog No. 220) A 4-page flyer which emphasizes safety features, in addition to technical specifications of this wagon crane which includes a cantilever boom that eliminates boom-hoist cables. Tractor and Equipment Co.

26. Clark Materials Handling Equipment. This condensed catalog contains basic specifications of this concern's entire line of materials-handling equipment. Covers fork-lift trucks, towing tractors, etc., and various accessories. Industrial Truck Division, Clark Equipment Co.

27. Universal 220QS TwinDual Gravel King. This bulletin describes a complete portable gravel crushing, screening, and loading plant with three stages of crushing and two screening operations. Bulletin No. U501. Universal Engineering Corp.

28. Lodover. Illustrated 8-page Bulletin LO 200 describes this 1-cu. yd. combination overhead and front-end shovel for International Harvester tractors. Service Supply Corp.

29. Type 256 High Voltage Air Break Contactor; Type H Motor Starters. These two bulletins depict motor starters for 2,300- to 5,000-volt squirrel cage, wound rotor, synchronous and multi-speed motors, and an air break contactor adaptable for applications requiring frequent starting, reversing, or dynamic braking. Allis-Chalmers Mfg. Co.

30. Jaeger Sure-Prime Contractors Pumps. (Catalog P-10) An extensively illustrated, indexed catalog which provides much technical information and examples of applications of dewatering, pressure, and electric pumps and well-point systems. The Jaeger Machine Co.

31. Ajax Dihedral Couplings. 6-page folder presenting the performance, construction, and uses of this coupling. Instructions for ordering and data on service factors are also included. Illustrated with photographs and sketches. Ajax Flexible Coupling Co., Inc.

32. Aircomatic Welding Process. Reprint of a 26-page article that originally appeared in *The Welding Journal;* discusses the fundamentals of metal-arc transfer in inert-gas-shielded arc welding. Illustrated with 60 photographs and charts, includes 14 tables of test and specification data. Air-Reduction Sales Co.

33. Marion Type 43-M Excavator. (Bulletin No. 400) Lists and illustrates this machine's various applications as a shovel, dragline, clam shell, crane, backhoe, and pile driver. Marion Power Shovel Co.

34. Models 60 and 105 Pneumatractor Self-Propelled Air Compressors. (Bulletin NEU-50B) Lists and illustrates features, specifications, standard and extra equipment, and recommended wheel arrangements. Schramm, Inc.

35. Series 500 Strip-Chart Dynamaster Electronic Instruments. (Bulletin W1821) Gives information concerning new instruments for reporting and indicating such variables as temperature, resistance, conductivity, strain, position, inductance, pressure, and force. Bristol Co.

36. Hardinge Tricone Mill. (Bulletin AH-414) Describes the operating principles, and design features of this recently developed Tricone mill which is a modification of the Hardinge conical mill. Includes typical flow sheets for both wet and dry grinding applications, and performance data. Hardinge Co., Inc.

37. Permalite Lightweight, Insulating Concrete. A new technical data sheet giving general review of uses and mix design data which includes typical properties showing 28-day compressive strength, oven dry density and thermal conductivity, mix proportions, and materials required per cubic yard of concrete. Building Products Division, Great Lakes Carbon Corporation.

38. Buda 161 Series Diesel Engines for All Types of Trucks. (Bulletin 1506) 16-page catalog describes the new Buda DA Dyna-Swirl diesel engines designed for all types of heavy-duty trucks. Includes detailed specifications and an explanation of the Dyna-Swirl controlled combustion system. The Buda Company.

39. Ni-Hard Cuts Cement Plant Costs. An illustrated flier giving information on the ways that Ni-Hard (nickel-chromium white iron) can be applied in order to combat abrasive wear of liners, grinding balls, and other such components. Abrasive Alloy Castings Company.

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WILLIAM M. POWELL, safety director of the Medusa Portland Cement Company of 21 years, died on August 8 at the age of 64 years. He began his safety career as chairman of a departmental safety committee at the Illinois Steel Company in South Chicago in 1912. Before joining Medusa, he was associated with the E. I. du Pont de Nemours Company at Hopewell, Va., heading the plant's safety department.

While he was with Medusa, his activities covered eight plants and other company units. He was a senior member of the accident prevention committee of the Portland Cement Association, having served continuously since 1938. In 1942-43 he was general chairman of the Cement & Quarry Section of the National Safety Council, and as a member-at-large of that group he had accepted an invitation to take part in the section's program at the National Safety Congress in October.

Under his direction, the Medusa plants built outstanding safety records. All company units were operated without a single disabling injury during the year 1942. Medusa's York (Pa.) plant established a record early this year of 13 consecutive years' operation without a disabling injury.

STEWART H. DEWSON, chief engineer of the Pennsylvania-Dixie Cement Corporation (all plants) since January of this year (see PIT AND QUARRY, April, 1950, p. 88), died on September 14 at a hospital in Allentown, Pa. He was 58 years of age.

Before joining Penn-Dixie in 1926 Mr. Dewson had served as draftsman in the Navy, plant engineer for the Portland Cement Company, and assistant conservation engineer for P.C.A.

WILLIAM JAMES TIMBERMAN, 84, a former leader in the sand and gravel industry in the New York metropolitan area, died Sept. 30 at his home in Ridgewood, N. J.

After having earlier operated a general lighterage business in New York harbor, Mr. Timberman formed the Long Island Sand and Gravel Company, one of the first such firms to transport building sand from eastern Long Island to New York via water. During 1901 this company was merged with the Goodwin Brothers Company, under the latter name, and Mr. Timberman became vice-president and general manager.

In 1912 Goodwin Brothers was sold to the Gallagher Sand and Gravel Company, and Mr. Timberman retired from active business, but it proved to be only a temporary withdrawal. Early in 1917 he assumed the direction of the Nassau Sand and Gravel Company, and continued with that firm until his final retirement in 1938.

During his career, Mr. Timberman operated Long Island sand properties at Sands Point, Hempstead Harbor, Oyster Bay, Cold Spring Harbor, Eaton's Neck and Port Jefferson. He was widely recognized as an authority on sand quality control, production and transportation.

Add a BIG *SAFETY* FACTOR to your hoist

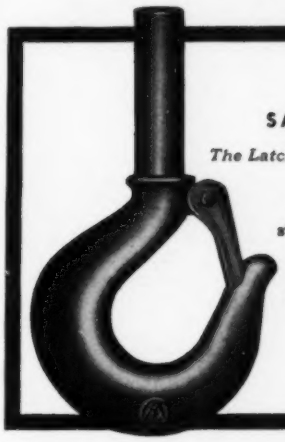
A Laughlin Safety Hook will boost the "safety efficiency" of your hoist many times . . . protecting workers against injury and equipment against damage from accidentally slipping loads.

Make sure your next Hoist is equipped with a LAUGHLIN SAFETY HOOK

Specify "Laughlin Safety Hooks" when ordering new hoists from your distributor. They pay for themselves many times over in accidents avoided.

Play safe — change over your present Hoist Hooks to LAUGHLIN SAFETY HOOKS

Order from your distributor according to the size now on your hoisting equipment . . . or state the capacity of your hoist and he will furnish the correct Laughlin Safety Hook to fit your needs.



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Drop-forged steel, heat-treated . . . stainless steel spring with pressed steel latch. Cast bronze latch on larger sizes. Available for ½ to 15 ton safe working loads.

Send for Laughlin's famous data book of fittings — ask for Catalog #145. THE THOMAS LAUGHLIN COMPANY, DEPT. 3, PORTLAND 6, MAINE.

***There is a* LAUGHLIN SAFETY HOOK *for every* HOISTING or MATERIALS-HANDLING JOB**

3310
½ to 15 tons

3220
½ to 15 tons

3316
½ and 1 ton

3315
750 pounds

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YUBA DREDGES — PROVED DEPENDABILITY ROUND THE WORLD

YUBA ARS Screen 50' 6" long, 9' in diameter, weighing approximately 65 tons, installed on dredge YCGF No. 20.

Before you make your next selection of screen plate material, you will find it profitable to investigate thoroughly YUBA's Abrasion Resisting Steel* Screen Plates. These plates are made for all screening purposes — separating, scrubbing, sizing. They are made from high carbon, high manganese alloy steel with a Brinnel hardness of 200 to 250; thus assuring great resistance to abrasion and long, useful screen life. They are competitively priced, because YUBA buys in heat lots from the mill.

SPECIAL EQUIPMENT BUILT TO ORDER

Complete steel fabricating, forging, and machine shops at your service. Send us your blue prints or specifications for prices.

FLAT OR REVOLVING TYPE CUSTOM-BUILT FOR YOU

YUBA stocks ARS plates in all usual thicknesses from ¼" up. Either flat or revolving screens with perforations to fit your exact needs can be manufactured quickly. You will get proper fit and fast installation because YUBA screens are rolled true, cut square to close limits. Holes are taper drilled and special tapers can be furnished as needed.

PROVE THEM ON YOUR OWN JOB

YUBA experimented with ARS Screen Plates when first offered by U. S. Steel and now has a steadily increasing number of customers who are standardizing on long-wearing ARS screens and liners. Try them on your job and prove for yourself how you can increase average running time and thus reduce yardage costs. Send us your order NOW. Remember, all usual thickness from ¼" up available from stock for quick delivery.

*United States Steel product

YUBA MANUFACTURING CO.

Room 718, 351 California St., San Francisco 4, California, U. S. A.

AGENTS / BIRKE, DARBY & CO., LTD. - SINGAPORE, KUALA LUMPUR, PENANG. / SHAW DARBY & CO., LTD., 14 & 19 LEADENHALL ST., LONDON, E. C. 3.

CABLES: YUBAMAN, SAN FRANCISCO - SHAWDARBCO, LONDON

SOLOMAN SMITH, 50, a freight car unloader for the United States Gypsum Company at Jersey City, N. J., was victim of a fatal accident on September 25. According to a witness, Mr. Smith's head was crushed between a freight car and a truck as he leaned down to place a wooden chock on the rails. He was taken to a hospital, but died in a short time.

EDWARD Q. JOHNS, a former employee of the Monon Crushed Stone Company, Monon, Ind., died on August 30 in that city at the age of 76 years. The cause of his death was a heart seizure.

A. VOLNEY FOSTER, former president of the United States Silica Company of Ottawa, Ill., died on September 4 at Lake Forest, Ill. Mr. Foster was 73 years of age.

STATEMENT OF OWNERSHIP

Statement of the ownership, management, and circulation, required by the Acts of Congress of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946, (Title 39, United States Code, Section 233) of PIT AND QUARRY, published monthly at Chicago, Illinois, for October 1, 1950.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Complete Service Publishing Company, Chicago, Ill.; Editor, W. E. Trauffer, same; Managing Editor, W. E. Trauffer, same; Business Manager, James E. Montgomery.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given).

Complete Service Publishing Company, Chicago, Ill.
Harry W. Baumgartner, same.
Ida A. Baumgartner, same.
James E. Montgomery, same.
Evelyn W. Montgomery, same.
Stanley A. Phillips, Evanston, Ill.
Florence S. Phillips, same.
Ray L. Smith, Jr., Bartlett, Ill.
Lanetta B. Smith, same.
William T. Klussman, Brookfield, Ill.
William T. Klussman and Lanetta B. Smith, Trustees of Bernice Joan Smith, Trust No. 1, Chicago, Ill.
William T. Klussman and Lanetta B. Smith, Trustees of Harry William Smith, Trust No. 1, same.
William T. Klussman and Lanetta B. Smith, Trustees of Ray Light Smith, 3rd, Trust No. 1, same.
William T. Klussman and Lanetta B. Smith, Trustees of Stephen Howard Smith, Trust No. 1, same.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of the total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above was ..... (This information is required from daily, weekly, semi-weekly and tri-weekly newspapers only.)

JAMES E. MONTGOMERY,
Signature of Business Manager.

Sworn to and subscribed before me this 19th day of September, 1950.

(SEAL) FRANK J. CORNYN.

(My commission expires Sept. 5, 1954.)

trade notes

E. R. Galvin

The Buda Company of Harvey, Ill., manufacturers of Buda Diesel and gasoline engines and other products used in the construction industry, announce the appointment of E. R. Galvin as merchandise manager.

Ed Galvin has long been a prominent figure in construction circles, having served successively as general sales manager of the Caterpillar Tractor Company, R. G. LeTourneau, Inc., and the La Plant-Choate Manufacturing Company, in which positions he gained a wide knowledge of construction practices with both track type and rubber-tired equipment.

As merchandise manager of The Buda Company, Mr. Galvin will supervise retail sales through the Buda distributing organization. His headquarters will be in Harvey.

J. C. Gorman, president of The Gorman-Rupp Company, Mansfield, O., recently announced the establishment of a new department within the company specializing in the development of small centrifugal pumps.

At the same time Mr. Gorman announced the appointment of Edward M. Smith as hydraulic engineer and Horace M. Montgomery as project engineer for the new department. Mr. Smith was formerly chief engineer of the Pump Division of Barnes Manufacturing Company, and Mr. Montgomery was formerly new products engineer of the Pump Division at Barnes.

The appointment of R. E. Bansemer to the position of assistant general sales manager has been announced by the Koehring Company of Milwaukee, heavy-duty construction equipment manufacturers. At the same time, Koehring named three new district sales representatives: R. K. Patterson, who will be stationed in the New England sector, C. Byron Walker in the Pacific Northwest, and Al W. Schlosser in the southeast.

In his new post, Mr. Bansemer succeeds John E. Chadwick, who will join the Dalrymple Equipment Company organization, Koehring product distributor in the state of Mississippi.

The Cleveland office of the Robins Conveyors Division, Hewitt-Robins Inc., has been moved from 215 Rockefeller Bldg., to 8905 Lake Ave.

Appointment of Manford R. Lillengreen as sales manager of Baer Steel Products, Inc., Auburn and Renton, Wash., has been announced by Joe Baer, general manager. Mr. Lillengreen will maintain his contacts with contractors in all parts of the U. S. and in addition, will franchise new dealers. Products offered include a complete foundry line of contractor's equipment including "Fibraloy" dragline, shovel, and hoe buckets and accessories for all makes of excavating buckets.

Appointments have been made in several divisions of General Electric, as follows:

William S. Ginn has been appointed manager of sales of the company's Company's Transformer and Allied Product Divisions, with headquarters in Pittsfield, Mass. Mr. Ginn, assistant

FEEDING—
CONVEYING—
SEPARATION—
WITH *SYNTRON*

VIBRATORY FEEDERS

Flow bulk materials like water. Rheostat or reactor control of rate of flow—from a gushing torrent to a trickling dribble. Capacities from a few pounds to hundreds of tons per hour.

VIBRATING GRIZZLIES

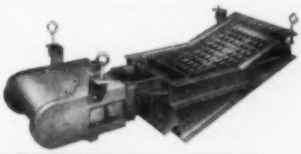
Coarse scalping of bulk materials—with variable rate of flow.

Cushioning belts with fines as protection against big abrasive chunks — bypassing fines, etc.

VIBRATING SCREENS

For close sizing and classification of materials.

Dedusting — dewatering and washing, with variable control of rate of flow.



LONG VIBRATORY CONVEYORS

Conveying rough abrasives — hot, dusty materials—pure, clean materials without contamination.

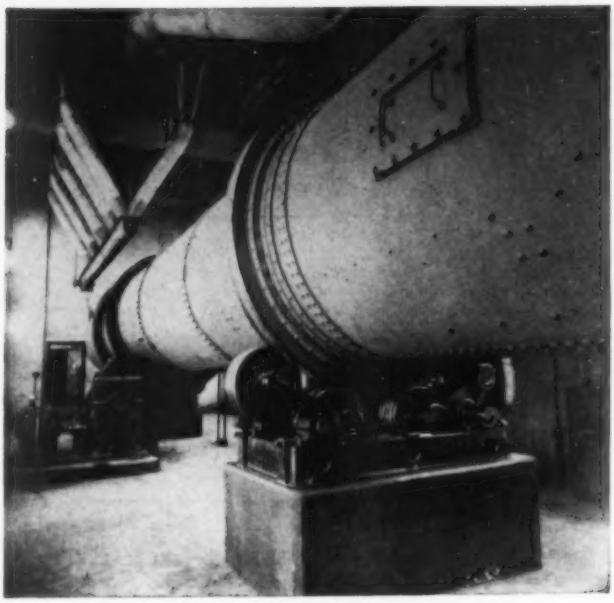
Write Us About Your Problem

Our Engineers will be glad to recommend the proper Syntron equipment. Or ask for a copy of our new, complete, catalog.

SYNTRON CO.

385 Carson **Homer City, Pa.**

CEMENT OPERATORS LICK WET COAL PROBLEM WITH ROTARY DRYERS



A Double-Shell "XA-12" Ruggles-Coles Rotary Dryer drying coal in a cement plant, ahead of pulverizers.

Many cement plant operators are reporting increasing difficulty in pulverizing coal for their kilns, due to higher moisture content in the coal now available. This is due to the fact that more, lower-grade, finer coal, with moisture-retaining properties is now being dumped on the market.

Coal mills will not handle this feed properly.

Operators have solved this problem with a medium-sized rotary dryer ahead of the pulverizers. For instance, one cement plant operator has just installed an "XA-12" Double-Shell Ruggles-Coles Rotary Dryer near his outside coal storage pile, with a by-pass arrangement for use in dry seasons. Capacity of the dryer is 17 tons per hour, reducing moisture from 15% to 6%, or from 10% to 3%.

Another cement firm bought two Double-Shell "XA-10" Ruggles-Coles Dryers recently, for their coal preparation plant storage system.

With oil-burners or stokers it is possible to make the drying system completely automatic. Advantages of a rotary dryer system are: increased capacity of the coal pulverizers; lower power consumption of the pulverizers; better fuel-burning ratio (less coal per barrel of cement); increased kiln output; no plugging in bins or feeders ahead of the pulverizers; increased fineness from pulverizers.

For full information about Ruggles-Coles Rotary Dryers, write Hardinge Company, Inc., for Bulletin 16-D-8.

HARDINGE

COMPANY INCORPORATED

YORK, PENNSYLVANIA — 240 Arch St. • Main Office and Works

NEW YORK 17—122 E. 42nd St. • 205 W. Wacker Drive—CHICAGO 6

SAN FRANCISCO 11—24 California St. • 200 Bay St.—TORONTO 1

CONICAL MILLS | COUNTER CURRENT CLASSIFIERS | THICKENERS CLARIFIERS | RUGGLES COLES DRYERS | CONSTANT WEIGHT FEEDERS | TUBE ROD AND BATCH MILLS

sales manager of the Transformer and Allied Product Divisions since September 1, 1949, succeeds Francis E. Fairman Jr., who was named general sales manager of the company's Large Apparatus Divisions.

Robert C. Hanna has been appointed manager of sales of the company's Fractional-Horsepower Motor Divisions at Fort Wayne, Ind. Mr. Hanna succeeds Arthur W. Bartling, who recently was named general sales manager of the company's Small Apparatus Divisions, Apparatus Department, with headquarters at Lynn, Mass.

Harrison D. Beale has been appointed manager of the Renewal Parts Division, Industrial Divisions, GE Apparatus Department, according to an announcement by K. H. Runkle, divisions manager.

Robert B. Moore has been appointed manager of the Mining Division of GE's Industrial Engineering Division, it was announced recently by J. D. Wright, the division manager. Mr. Moore will succeed R. S. Sage, who plans to retire soon.

Hugo W. Liebert, general works manager of six Tractor Division plants of the Allis-Chalmers Manufacturing Company, has retired from active service with the company. Mr. Liebert recently completed 43 years with Allis-Chalmers, having progressed through various supervisory positions until his appointment as general works manager, in 1942.

Simultaneously with this statement, it was announced that John Ernst had been appointed to succeed Mr. Liebert as general works manager.

Two appointments have been announced by the Republic Rubber Division of the Lee Rubber and Tire Corporation, Youngstown, O. Howard H. Sprinkle has been appointed assistant sales manager of the division. Starting with Republic in 1923 and becoming a sales representative in 1933, he formerly represented the company in the Cleveland and Buffalo areas.

David L. Cushing recently joined Republic and will serve as a field engineer. Mr. Cushing will represent the company in territory embracing the entire state of Louisiana and parts of Florida, Mississippi, and Alabama.

P. B. Reed, manager, Industrial Equipment Division, Radio Corporation of America, has announced that the Eriez Manufacturing Co., Erie, Pa., has been appointed distributor for R.C.A. Electronic Metal Detectors. Eriez will handle all sales in the United States and Canada.

The appointment of C. L. Reynolds as control manager for the Union Bag and Paper Corporation has been announced. Mr. Reynolds joined the Union Bag organization in 1940. He succeeds W. A. West, who is resigning from the company.

• As announced in the October issue (page 114), the gentlemen pictured above recently won promotions in the Barber-Greene organization. At the left is Earl D. Stearns, formerly general sales manager, who has become manager of the Conveyor Division. Walter B. Holder, right, formerly sales manager of the firm's Construction Division, is now general sales manager.

The Bell-Lott Road Machinery Company, West Columbia, S. C., was recently appointed distributor for Bucyrus-Erie general-purpose excavators, according to an announcement released by the Bucyrus-Erie Company, South Milwaukee, Wis. Bell-Lott will sell and service gasoline, diesel, and single-motor electric ⅜- to 4-cu. yd. excavators and the truck-mounted Hydrocrane throughout South Carolina.

What is said to be the world's largest research laboratory devoted to the development of safety equipment for all industries was recently dedicated in Pittsburgh by the Mine Safety Appliances Company.

Virtually every branch of science and engineering is utilized at the laboratory for developing protective equipment and instruments. The laboratory is staffed by chemists, physicists, electrical engineers, and other scientists.

In the four-story laboratory building are many types of research instruments and equipment. These include high altitude chambers; dust, fume and gas chambers; a wind tunnel; and an electron microscope which permits study of dusts and other substances at a magnification up to 100,000 times.

The Euclid Road Machinery Company, has announced the appointment of Alan S. McClimon as manager of sales development. Prior to joining Euclid as a special representative, Mr. McClimon was associated with Mack Trucks Incorporated as a special representative for off-highway truck sales.

In his new position he will supervise the activities of Euclid field engineers and will assist Euclid distributors and owners with operating data, special designs and applications of Euclid equipment, and the development of new markets and models.

No Lazy Spots . . .

Here's the kind of efficient screening of materials that Seco Vibrating Screens are performing day after day, year after year. Seco's patented construction puts every inch of screen to work . . . there are no "lazy spots" to rob you of tonnages and profits. Get the whole Seco story. Send for Catalog #203, Dept. L.

Made only by Screen Equipment Co., Buffalo, N. Y.
In Canada: United Steel Corp., Toronto, Ont.

Seco distributors are located throughout the United States. Write for name of the one nearest you.

PYRASTEEL

PYRASTEEL's amazing record of service is demonstrated by the old type Kiln Ring, shown at left, which withstood high temperatures in a large cement plant in Dallas, Texas, for over 14 years.

This solid ring casting, recently scrapped, weighed 4200 lbs. Today's segmented type Kiln End of the same size would save at least one ton in weight, and about $1000 in cost.

Over 76% of the annual cement output is produced in plants that now are using either or both of our alloys, PYRASTEEL and EVANSTEEL.

Durable PYRASTEEL Kiln Ends, for feed or discharge end, enable modern cement plants to avoid costly burnouts and shutdowns.

PYRASTEEL is economically adapted for many other high-heat applications, including conveyor screws, clinker coolers, feed pipes, and drag chains.

In the past 21 years over 1000 PYRASTEEL Kiln Ends have been installed. Some have lasted for 16 years without a failure.

Write for PYRASTEEL Bulletin

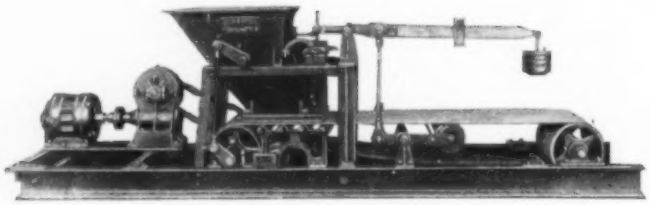
CHICAGO STEEL FOUNDRY CO.
Kedzie Ave. & 37th St., Chicago 32, Ill.

Makers of Alloy Steel for Over 40 Years

"Always a STAR PERFORMER"

for weighing bulk materials

SCHAFFER POIDOMETER



Year-after-year dependability and high operating economy explain the popularity of SCHAFFER Poidometers among producers of raw and finished materials.

Hand these automatically-working machines any scaling job—including weighing, mixing, blending, feeding, recording, and proportioning—and you get precise weight information, fast.

Poidometers are made in capacities up to 300 tons per hour. Available with remote controls for showing and changing feed rate, and total weight recorders.

Write for our CATALOG No. 5

SCHAFFER POIDOMETER COMPANY, 2828 Smallman Avenue, Pittsburgh 22, Pennsylvania

Arkell & Smiths has announced the promotion of T. L. Jones to the post of Central Division sales manager, supervising Michigan, Indiana, Ohio, Western Pennsylvania, West Virginia, Southern Illinois, and Kentucky. Mr. Jones will continue to maintain headquarters at the Arkell & Smiths office, 1384 Grandview Avenue, Columbus 12, O.

Donald D. Fitz has been named Iowa sales and service representative for the D-A Lubricant Company, Inc. of Indianapolis.

Until his appointment as a D-A representative, he was a salesman in Denver for the Continental Air Lines and Timpte Brothers, Inc. His business headquarters will be in the Blue Line Storage Co., 200 Elm Street, Des Moines, Ia.

James A. Driessen, treasurer and assistant general manager of The Four Wheel Drive Auto Company, was elected a member of the Board of Directors of the Company at a recent regular meeting of the board. Mr. Driessen has been with FWD for 20 years. He was named treasurer of the company in 1947, and in that position organized and placed in operation FWD's highly successful budget system. He was appointed assistant general manager in October, 1949.

C. D. Cashman

This portrait of Charles D. Cashman, newly appointed representative of the Kennedy-Vann Saun Manufacturing & Engineering Corporation of New York in Canada, unfortunately arrived too late for our October issue.

Mr. Cashman's new position will cover K-VS products in the Canadian mining and quarrying industries. His offices will be at North Bay, Ont., Canada.

A newly-created position of central sales manager, directing the sales of the Worthington Pump & Machinery Corp. in the Buffalo, Detroit, Cleveland, Cincinnati and Pittsburgh offices, has been filled by William A. Meiter. John W. Stovall has been appointed manager of the Buffalo District Sales Office, succeeding Mr. Meiter.

J. P. Waite, Inc., 3304 West Pierce Street, Milwaukee 4, Wis., is the new dealer for Hyster industrial materials-handling trucks in eastern Wisconsin and northern Michigan, according to an announcement from C. H. Collier Jr., Eastern Division sales manager.

Territory covered for the Hyster Company, whose three factories are in Portland, Ore., and Peoria and Danville, Ill., will include 46 counties of eastern Wisconsin and 15 counties of northern Michigan.

legal decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

A few weeks ago a reader asked the writer these legal questions: "What must the owner of a gravel pit do to avoid damage liability if a person is drowned in water which accumulated in the pit? Does the law require the owner of the property to erect a fence around the pit?"

According to a recent higher court, the answer to these questions are as follows: If an adult was drowned while trespassing on private property, there is no liability. As to children, the owner of the gravel pit should use "reasonable care" to prevent trespassing children from playing on the property or swimming in the pit. The law does *not* require the owner of the property to erect a fence to keep children from trespassing on the property.

Recently a higher court held that the owner of a gravel pit in which a small child was drowned cannot be held liable in damages to the parents of the child, unless the testimony clearly shows that *negligence* of the owner of the pit was the proximate cause of the fatality.

For illustration, in *Graves v. Dachille Sand and Gravel Company*, 43 N. W. (2d) 64, the testimony showed facts as follows: The Dachille Sand and Gravel Company excavated sand from its property with a power shovel. To prevent interference by water with its excavating operations, the company dug a hole or sump in the low portion of its property and as drainage water collected in this sump, it was pumped through a hose into the public sewer. The sump pump got out of order, and a considerable quantity of water collected in the hole or sump.

One day a boy six years old took off his clothes and went into the water. He was drowned. His parents sued the Dachille Sand and Gravel Company for damages and proved that it had permitted water to accumulate in the sump, and that this water was stagnant and the surface covered with oily scum. Also, the property was unenclosed. The parents alleged that the (1) company's officials were negligent because they allowed stagnant water to accumulate and remain in the sump, knowing that children frequented the premises; (2) that they failed to erect fences or to provide effective guards to keep children away from the excavation, especially since it was known to the officials that these premises were frequented by both adults and children; (3) that they failed promptly to replace the "broken pump" which had been used to remove water from the sump.

Nevertheless, the higher court refused to hold the Dachille Sand and Gravel Company liable in damages for death of the boy, saying:

"Defendants' (company's) business of excavating on their own property and disposing of sand was obviously a legitimate enterprise. The digging of a hole or sump in which to collect drainage water was a necessary incident to the business, and allowing water to accumulate in the sump on defendants' property was within their legal right. We do not find in the record that to defendants' knowledge any boy had previously gone swimming in this sump, or that any one had ever called to defendant (company's) attention that such might happen with fatal results. Defendants were not obligated to fence their premises in an effort to prevent trespassers from entering and going into the excavation thereon where water had collected."

Another important point proved at the trial was that the company had failed to abate the nuisance condition even after the company, on complaint of persons residing in the locality, was found guilty

"DON'T KNOW HOW WE'D GET ALONG WITHOUT IT", says Bela G. Lindenfeld, Terminal Materials Company, St. Joseph, Michigan.

This Michigan ⅜ yard Truck Excavator handles 30,000 tons of crushed stone and agricultural lime per year . . . stock piling over reclaiming tunnels . . . loading out trucks . . . clean-up work. In addition, it is used for erection and dismantling work around the plant and is rented out for excavating and steel-setting jobs. Its exceptional mobility and versatility really pay off, says Mr. Lindenfeld. And, he likes the Michigan's operating economy, too.

This is typical of the experience of MICHIGAN owners everywhere. Next time you need an excavator crane, investigate MICHIGAN — the most complete line of ⅜ and ½ yard excavators available.

MICHIGAN POWER SHOVEL COMPANY
315 Second Street, Benton Harbor, Michigan, U.S.A.

CROWN carbide cutting a necessity in drilling today

—say foremost quarrymen

From Statement By Prominent Quarryman

"We are old hands in the business, naturally we have tried all bits, but say without hesitation that Rok-Bits CROWN carbide cutting is writing new history in fast, economical drilling for us."

Rok-Bits' CROWN carbide cutting affords faster drilling than you have ever experienced. And in other ways Rok-Bits are engineered to better your footage at less cost. Note how air holes are placed for better blowing—self-clearing chip channels—threads designed especially to match this bit's outstanding performance. Check your present bit's performance against Rok-Bits. Request FREE Booklet. Rock Bit Sales & Service Co., 2514 E. Cumberland Street, Philadelphia 25, Pa. *Branch:* Asheville, N. C. *A complete line of pneumatic tool accessories.*

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Is Your Plant Wasting Valuable Fine Sand?

- The Cottrell Separating Cone*, a revolutionary new development, is a "must" for the sand-and-gravel plant.
- Users report recovery of up to 10 tons per hr. of clean fines in the 30 to 200-mesh range, from classifier overflow formerly wasted.
- Low in first cost, maintenance free operation, extremely low operating cost, a Cottrell Cone will pay for itself in a few weeks in sand saved—and blend in the valuable fines you need to meet today's rigid specifications.
- Built in sizes to meet your requirements—get the facts at once!

*Patent Applied For

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LONGER PRODUCING LIFE BUILT INTO

FARREL-BACON CRUSHERS

Permanent strength and operating efficiency is engineered into these crushers at every vital point. Farrel-Bacon will provide industrial units or completely designed and equipped plants, including screens, elevators and conveyors. Also other types of mine, quarry, sand and gravel plant machinery. *Write for complete information.*

FARREL-BACON
ANSONIA, CONNECTICUT

BA 7

of maintaining a nuisance, and *convicted* eight or nine days before the death of the boy.

In this respect the court said: "Testimony that for a relatively short time immediately prior to the drowning of plaintiffs' son defendant (company) failed to repair a damaged pump that had been used to remove the water from the sump and had permitted water to accumulate in the sump, or that within eight or nine days after defendants were found guilty of permitting a nuisance on their premises they did not, as was ordered, abate the same, was no proof of gross negligence."

Contractor's License Cancelled

According to a recent higher court, a contractor's license may be cancelled if he wilfully overcharges a G. I.

For example, in *Penaat v. Zeiss*, 219 Pac. (2d) 60, it was shown that a state law provides that the doing of any "wilful or fraudulent" act by a contractor entitles a court to cancel his license.

A contractor charged a veteran $500 over the authorized ceiling price fixed by the Veterans' Administration.

The lower court cancelled the contractor's license and the higher court sustained the verdict, saying:

"In such a case, and unless it appears that there is no substantial evidence to support the judgment, the reviewing higher court will resolve all doubts in favor of that judgment."

Zoning Law

On my recent trip through the West, the owner of a concrete block plant asked the writer personally two important legal questions. Since the answers to these questions will interest all readers generally, I shall now render my opinions. Here is question No. 1: "Can a city's council refuse to issue a permit to construct and operate a block plant? My lot is located in a business district, but the city council's excuse for refusing to issue the permit is that they decided a block plant should not be operated there. Can I compel the city to issue a permit?"

The answer is: Yes, you can compel the city to issue the permit, unless the council acted by authority of a state law when refusing to issue the permit.

For illustration, in *Romero v. Viator*, 46 So. (2d) 256, it was shown that a state law clearly provides that municipalities shall issue building permits when the application for the permit conforms with the city ordinances. One Romero is the owner of real property located in an *unzoned* commercial area of a city. He made written application to the mayor and board of trustees, in conformity with the city ordinances, for a permit to construct a one-story building on his property for business use. Romero was informed by the city attorney that neither the mayor nor the city council would issue a permit.

In subsequent litigation the higher court ordered the city to issue the permit. In other words, since there is nothing in the ordinance, as authorized by a state law, indicating that the mayor is given discretionary powers to refuse to issue

building permits, he is duty bound to issue permits to all applicants in a business or commercial area.

Defrauded Creditor

Here is question No. 2: "Can a creditor to whom I sold concrete blocks on credit sell his personal property and avoid paying the money he owes me?" The answer is no.

For example, in *Ralph Keno v. Katterjohn*, 230 S. W. (2d) 89, the testimony showed facts, as follows: The Katterjohn Concrete Products sold $1,855 worth of concrete blocks to one Ralph Keno, who failed to pay for the blocks. Later the Katterjohn Concrete Products sued Ralph Keno for $1,855.00, with interest, for the concrete blocks sold to him, and asked for a general order of attachment against his property, including a certain motor truck which was transferred to one D. Keno, father of Ralph Keno, a short while before the suit was filed. The Katterjohn Concrete Products asked the court to cancel the transfer and sell the truck to satisfy the debt.

Both Ralph Keno and his father went to great lengths to convince the court that the transfer was made in good faith and with no intentions of defrauding the Katterjohn Concrete Products of the $1,855.00 due for concrete blocks purchased by Ralph.

Nevertheless, the higher court ordered the truck taken from D. Keno, father of Ralph, and sold to satisfy the debt owed by Ralph.

Payment for Extra Work

Modern higher courts consistently hold that contractors may recover payment for "extra work" if the contract does *not* clearly limit the amount of payment. Hence, with respect to excavation contracts, a contractor is not prevented from demanding payment for "extra work" if the contract does not clearly stipulate the amount of material to be excavated or removed at a definite price.

For example, in *Dyker Building Company v. United States*, 182 Fed. (2d) 85, it was shown that a sub-contract for excavations, fillings, gradings, stripping of top soil, furnishing of borrow fill and kindred work provided that the top soil over areas to be occupied by buildings, streets or other named areas should be removed to an average depth *of 6 inches* and stacked on the site.

During the excavations the sub-contractor removed 27,360 cubic yards of top soil, whereas if he had stripped the ground only 6 inches in depth, he would have removed only one-half this amount of top soil.

In subsequent litigation the higher court held that the sub-contractor may recover payment for 27,360 cubic yards of dirt on the basis of the contract price divided by the number of cubic yards at 6 inches depth. In other words, the sub-contractor was entitled to payment for the "extra" work at the regular contract rate. The court said:

"The specifications required that the existing top soil, in certain specified

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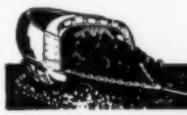

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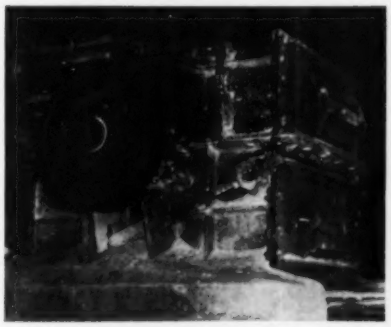

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areas was to be stripped to a certain thickness. No quantity limitation is mentioned in the contract between the parties or in the contract plans and specifications."

For comparison, see following cases: *Smoot v. United States*, 237 U. S. 38; and *Maryland Dredging & Contracting Company v. Coplay Cement Manufacturing Company*, 265 F. 842, 844.

Blasting Increases Volume

According to a recent higher court, estimates of the amount of earth and rock to be removed, when based upon an excavation having *vertical* sides, is not proper nor legal when both the owner and contractor contemplate blasting operations.

For example, in *Flanaghan v. Charles H. Tompkins Company*, 182 Fed. (2d) 92, it was shown that a contractor took a contract to construct trenches for concrete pipe sewers in earth and rock "with sides as vertical as possible," having a specified bottom width. It was contemplated that the work would be done by blasting. The contract went on to provide that "the amount of earth or rock excavation to be paid for will be the volume in its original position of earth or rock removed, as computed by the method of averaging end areas."

The owner prepared contemporaneous estimates of the amount of earth and rock removed, based on sections having perpendicular sides projected upon the specified bottom width. Later the owner tendered payment of the amount computed according to these estimates, as payment in full. This was refused by the contractor, who at all times demanded a larger payment than would be represented by these estimates, arguing that the blasting method precluded precisely vertical sides, and that he was entitled to payment based on the amount of material actually excavated.

The higher court approved this argument and ordered the owner to pay the contractor for the total amount of material excavated.

Option Is Assignable

Considerable discussion has arisen from time to time over the legal question: Is an option to purchase a business, materials, supplies, merchandise, etc., assignable? According to a recent higher court, the answer is yes.

For illustration, in *Wolbert v. Rief*, 71 Atl. (2d) 762, the testimony showed facts, as follows: One Wolbert owned the Howard County Supply Company, which property consisted of three acres of land improved by a retail store and warehouse, machinery, and tools used in the manufacture of cinder and concrete blocks, other machinery and tools used in the manufacture of concrete burial vaults, a number of motor vehicles, furniture, and office equipment. Wolbert signed a contract with one Rief by which the latter agreed to purchase the entire business for $71,000. The contract contained a clause as follows: "In the event buyer (Rief) should decide within one year not to retain the burial vault business mentioned

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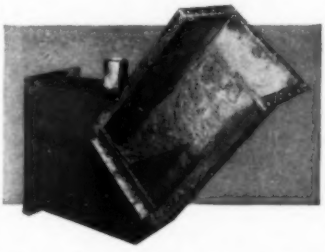

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herein, seller (Wolbert) agrees to purchase said burial vault business from the buyer for the sum of five thousand one hundred dollars ($5,100)." Rief sold the supply business to a man named Simon and another. Then Simon notified Wolbert that he would resell the burial vault business to Wolbert, but Wolbert refused to repurchase it.

Wolbert contended that he had made the contract with Rief and was not obligated to repurchase the burial vault business from Simon.

In subsequent litigation the higher court ordered Wolbert to repurchase this branch of the supply business from Simon for $5,100, saying: "An option is a contract, and the right of the promise (Rief) is assignable as any other contractual right. . . . The resale option was an integral part of the original contract. The original seller (Wolbert) obligated himself to repurchase part of the business assets for a fixed sum of money."

Independent Contractor

Modern higher courts consistently hold that an employer need not pay compensation insurance under either the State or Federal Workmen's Compensation Act, or the State Unemployment Compensation Act, on an independent contractor. And an employer need not pay other taxes, as Social Security, on an independent contractor. And again an employer is not liable in damages for injuries effected or caused to persons or property by an independent contractor. Hence for these reasons it is important for all readers to have at hand a dependable rule to determine whether or not an employee is an independent contractor.

According to a recent higher court, *if* an employer can terminate a contract of employment *before* a job is completed, the employee is *not* an independent contractor.

For example, in *Deason v. Operators Casualty Company*, 43 So. (2d) 630, it was shown that an employee named Deason was employed to furnish his own trucks for hauling material. He paid his own employees, doing some work himself. He was paid on a contract basis, but the employer could discharge Deason at any time. While engaged in these operations Deason sustained accidental injuries resulting in his total and permanent disability.

These questions were presented to the higher court: Is Deason an independent contractor? If not, can he receive compensation from the State Workmen's Compensation Act? If he is an independent contractor, can he receive any compensation?

It is interesting to observe that the higher court held that Deason is *not* an independent contractor, and awarded compensation under the State Workmen's Compensation Act. The court said: "The essential criterion seems to be found in the ability of the employer to terminate the work at will. Any employee cannot deem to be independent when his work can be stopped at the will of the employer, because the power to terminate the employment gives to the employer the power to control the activities of the employee."

Also, see *Murphy v. Tremont Company*, 22 So. (2d) 79. Here the testimony showed that one Murphy entered into a written contract with a company to transport materials and supplies. The contract, in considerable detail, set forth the rights of both parties, providing for a date of beginning work and a final time limit for the completion of the work. In other words, the employer could not discharge Murphy until the term of the written contract expired. Therefore, the higher court held that Murphy *is not a legal employee* but an independent contractor. The court said: "Neither party had the right to terminate the work except upon completion of the entire work contracted for."

Legal Effect of Tariff

According to a recent higher court, a tariff schedule on file with a state's commerce commission has the same legal effect as a state law.

For example, in *Coon Valley Gravel Company v. Chicago, R. I. & P. R. Company*, 41 N. W. (2d) 676, it was shown that a tariff schedule was on file

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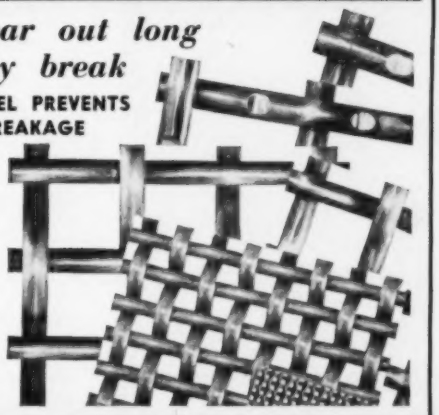

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with the Iowa State Commerce Commission. This tariff specified a basic rate with a minimum which applied to hauls less than three miles. In hauls in excess of three miles charge would be $8.91 per car.

The Coon Valley Gravel Company shipped 106 carloads of sand and gravel to industries. Each car weighed in excess of 115,000 pounds and was hauled a distance in excess of three miles but less than five miles. For this service the company paid the carrier at the rate of one and three-fourths cents per 100 lbs. actual weight, or the sum of $2,311.26, plus tax of $69.43.

The company's counsel alleged that under the tariff schedule the correct rate was a flat charge of $8.91 per car, irrespective of the actual weight.

The higher court refused to agree and held that a tariff schedule on file with a commerce commission has the same legal effect and force as a state statute, and even though a mistake is apparent, the tariff must stand valid as filed until corrected.

Money Lender is Liable

According to a recent higher court, a person who loans money on chattels or personal property is liable for the value of equipment, and accessories later sold to the owner of the vehicle by an innocent party.

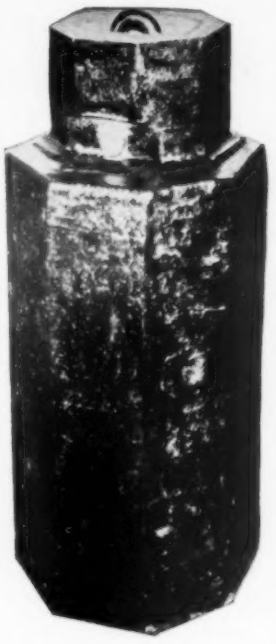
For example, in *Harlan v. Mennen*, 40 N. W. (2d) 48, the testimony showed facts as follows: One Mennen needed a motor truck to haul lime, and he purchased on the installment plan a used Chevrolet truck from the Hawn Company. Mennen gave to the Hawn Company a chattel mortgage on the truck to secure payment of the balance due. This instrument was recorded.

At this same time one Harlan was operating a quarry and lime pit. He sold his products to various farmers to be spread upon their fields. Harlan hired Mennen to haul lime. In order to carry on the hauling Mennen purchased a lime box, and accessories such as truck tires, engine head valves, and rear end assembly.

Mennen failed to pay the installments due on the truck. Hawn Company foreclosed the mortgage and repossessed the truck from Mennen.

The seller of the lime box and accessories filed suit against the Hawn Company, which had repossessed the truck, and asked the court to compel the latter to pay for the lime box and other parts he had sold Mennen to put on the truck.

It is interesting to observe that the higher court ordered the Hawn Company to pay the value of equipment as follows: the lime box $500.00; three tires and tubes for the Mennen truck, $165.00; the head and valves for engine in the Mennen truck, $29.00; the rear end assembly, consisting of one torque and tube, ring gear and pinion, two knuckles and two drive shafts, $100.00, total $794.



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Docket IRC 511-9-A—Stone, broken, crushed or ground, carloads, from Cannon, Mo., to Galesburg, Ill., minimum weight 90 percent of marked capacity of car, except that when car is loaded to full visible capacity, actual weight will apply. Present: $1.74 per ton of 2,000 lbs. (includes all increases). Proposed: $1.52 per ton of 2,000 lbs. (includes all increases).

Docket IRC 511-916-A—Crushed stone, carload, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight applies, from Anna, Ill., to Carbondale, Ill. Proposed: To cancel the present truck competitive rate of 65 cents per net ton and re-establish the normal rate of 96 cents per net ton. These rates include the ExParte 162-166-168 increases.

Docket IRC 511-1001—Proposed to establish on crushed stone in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply, from Krause, Ill., to Charleston, Ill. Present: 153 cents net ton, including X-162-166. Proposed: (A) (B) 139 cents net ton including X-162-166. (A) Expires with June 27, 1951. (B) Terminal rate—not to apply to or from intermediate points.

Application IRC 511-1005 (MRP 5515)—Proposed to establish on crushed stone, carload, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight, but not less than 60,000 lbs., will apply from Krause, Ill., to Sparta, Ill., and intermediate points shown below:

To (Representative Points):	Present X-166-C 7.62 per Car—plus 55c per Ton
Waterloo, Ill.	.80 per ton
Baldwin, Ill.	1.01 per ton
Sparta, Ill.	1.01 per ton

Proposed: 75 cents per ton of 2,000 lbs. (not subject to X-162-B or X-166-C). Rate to expire December 31, 1950.

CENTRAL TERRITORY RAILROADS FREIGHT TRAFFIC COMMITTEE

Docket 87863 (1)—Proposed to establish on stone, crushed, in bulk, in open-top cars, carloads, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Findlay, O., to Roscommon, Mich., 262 cents net ton.

Docket 87872 (1)—Proposed to establish on limestone, agricultural, unburned, in closed equipment, carload, minimum weight 50,000 lbs., from Osgood, Ind., to Cincinnati, O., 189 cents net ton.

Docket 87880 (2)—Crushed stone, carload, as described in Rule 20, I. C. Railroad tariff 13321-I, in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply, from Lehigh and Thornton, Ill., to I. C. Railroad station in Indiana. Rates shown in Exhibit A:

Exhibit A

To I. C. Railroad stations in Indiana, viz:	Rates in Cents per Ton, Include ExParte 162, 166 and 168 Increases	
	Lehigh Proposed	Thornton Proposed
Hovey, Griffin, Barrett, Stewartsville, Poseyville, Wendel, Martin, Armstrong, Evansville, Switz City, Bloomfield, New Harmony	153	169
Cass, Dugger, Victoria, Linton	139	153

Docket 87882 (2)—Proposed to establish on crushed stone, in bulk, in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Lehigh and Kankakee, Ill., to Wheatfield, Ind., 80 cents net ton, North Judson, Ind., 90 cents net ton. (Rates not subject to ExParte 162, 166 and 168 increases.)

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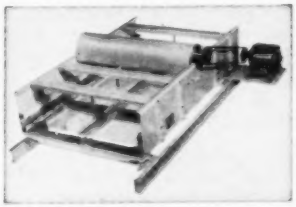

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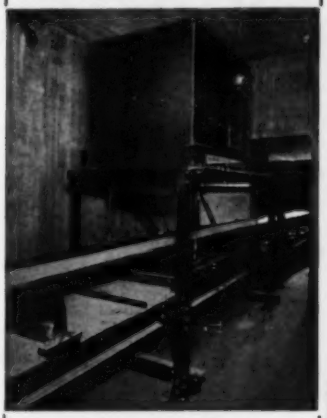

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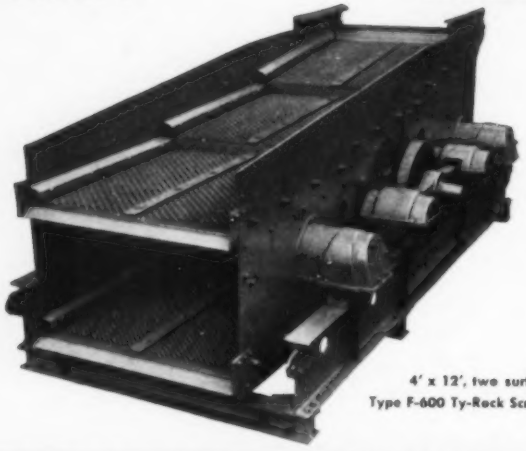

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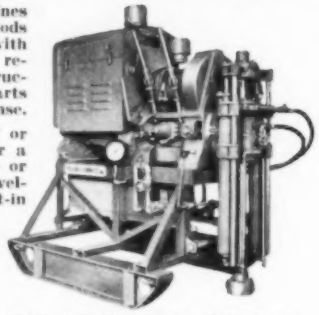

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Docket 87883 (1)—Proposed to establish on crushed stone, in bulk, in open-top cars, carloads, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Georgia, Ind., to Owensville, Mounts, Cynthiana and Poseyville, Ind., 134 cents net ton. (Rates not subject to ExParte 162, 166 and 168 increases.)

Docket 87901 (2)—Proposed to establish on limestone, agricultural, unburned, in open-top cars, minimum carload weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Millersville, O., to Montpelier, O., 171 cents net ton; Franklin, O., 179 cents net ton.

Docket 87904 (2)—Proposed to establish on limestone, agricultural, unburned, in open-top cars, not protected by tarpaulin or other protective covering, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Woodville, O., to Strasburg, O., 201 cents net ton. (Rates not subject to ExParte 162, 166 and 168 increases.)

Docket 87910 (1)—Proposed to establish on sand, all kinds, and gravel in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Beaver and Jackson, O., 171 cents net ton to Marble Cliff, O.

Docket 87911 (2)—Proposed to establish on stone, crushed, in bulk in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when cars are loaded to full cubical or visible capacity, actual weight will apply from Logansport, Ind., to Kalamazoo, Mich., 195 cents net ton; Battle Creek, Mich., 201 cents net ton.

Docket 87918 (1)—Proposed to establish on stone, crushed, in bulk, in open-top cars, carload, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Georgia, Ind., to Moccasin, Beecher City, and Cowden, Ill., 140 cents; Lakewood, Tower Hill, Pana, Millersville, Owaneco, Velma, and Taylorville, Ill., 147 cents net ton; Sharpsburg, Edinburg, Breckenridge, Berry, Rochester, Converse, Branch, and Springfield, Ill., 153 cents net ton.

FREIGHT TRAFFIC COMMITTEE—TRUNK LINE TERRITORY RAILROADS

Dock TL M-931 (Shipper)—Agricultural limestone screenings, carload minimum weight 90 percent of marked capacity of car, in open-top cars not protected by tarpaulin or other protective coverings from Thomasville, Pa., to Denton and Easton, Md., and Seaford, Georgetown and Milton, Del., $2.19; Cambridge, Md., $2.31; Centreville and Chestertown, Md., and Harrington and Milford, Del., $2.07; Dover, Smyrna, and Middletown, Del., $1.95; and Newark, Del., $1.83 per net ton, including all increases.

Docket TL M-934 (Shipper)—Crushed stone, carload minimum weight 90 percent of marked capacity of car, from Bowden, W. Va., to Gorman, Md., $1.10 per net ton, including all increases.

Docket TL M-952 (Carriers)—Proposed to establish on roasted dolomite (refractory dolomite), in granular form, treated or untreated, clinkered and/or burned to a dead state, carload minimum weight 90 percent of marked capacity of car, from Millville, W. Va., to Steelton, Pa., $2.46 per net ton, including all increases, in lieu of present rate of $2.65.

Docket TL M-962 (Shipper)—Proposed to establish on crushed stone, carload minimum weight 90 percent of marked capacity of car, from Bowden, W. Va., to Elkins, W. Va., 50 cents; to Norton and Harding W. Va., 70 cents; and to Belington, W. Va., 80 cents per 2,000 lbs., including all increases.

Supplement 1 to Trunk Line M-858 (Carrier)—Proposed to establish on lime, common, hydrated, quick or slaked, carload minimum weight 35 tons to Baltimore, Md.

From	Net Ton Including All Increases
Bittinger, Thomasville, and York, Pa., Spahrs and Frederick, Md.	275 cents
Pinola, Pa.	328 cents
Cavetown, Md.	309 cents
Bridgeport, Cedar Hollow, Cold Point, Exton, Howellville, Mill Lane Plymouth Meeting, Shainline, Swedeland, W. Conshohocken, and Williams, Pa.	328 cents
Annville, Avon, Lebanon, Myerstown, Palmyra, and Swatara, Pa.	328 cents

SOUTHWESTERN FREIGHT BUREAU DOCKET

Docket 53710 (2)—Proposed to establish on limestone from Carey, O. (and other origins in Northwestern Ohio Group), to Crystal City, Mo., publish through rates in cents per ton of 2,000 lbs., not subject to X-162-B, X-166-C or X-168-A on limestone, ground or pulverized, unburned, from Carey, O. (and other origins in Northern O. Group), to Crystal City, Mo.

NORTH PACIFIC COAST FREIGHT BUREAU AND PACIFIC SOUTH COAST FREIGHT BUREAU JOINT DOCKET

JT 1280 (S)—Lime (calcium) common, (hydrated, quick or slaked), including magnesium lime, carload, from Sloan and Henderson, Nev., to Oregon City, Salem, Albany, Eugene, Roseburg, Grants Pass, Medford, Ashland, and Klamath Falls, Ore., rate of 60 cents per hundredweight, minimum 30 tons; 52 cents per hundredweight, minimum 40 tons; and 48 cents per hundredweight, minimum 50 tons.

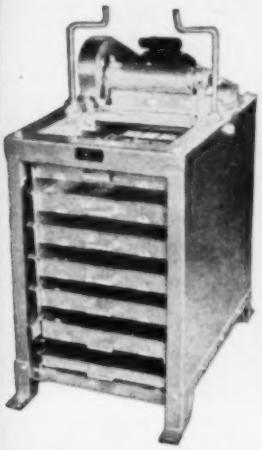
PACIFIC SOUTHCOAST FREIGHT BUREAU PROPOSALS

Docket (X) 1231 (Shipper)—Proposed to establish on lime, common, carload, from Salinas, Calif., to Tucson and Phoenix, Ariz., rate of $7.40 per ton of 2,000 lbs., minimum 50 tons.

Docket 1242 (Shipper)—Lime rock, including crushed, ground or powdered lime rock, carload, from Dos Cabezas, Calif. Request for rate of 26 cents per hundredweight to Phoenix and related rate to Yuma, Ariz., minimum 30 tons.

GILSON MECHANICAL TESTING SCREEN

For Fast and Accurate Sizing of Test Samples



Handles up to one cubic foot of crushed stone, gravel, and similar materials. Performs 2 to 7 separations at once. Sizes coarse or fines from 4" to 200-mesh. Durable and economical. Write for details.

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BOX 186, MERCER, PENNSYLVANIA

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ROLLER BEARING PILLOW BLOCKS

JONES Pillow Blocks are made in sizes to take shafts 15/16" to 9" in diameter. Equipped with double row Timken roller bearings. Engineered and designed for the most efficient solution of your drive problems. Ask for Bulletin No. 86.

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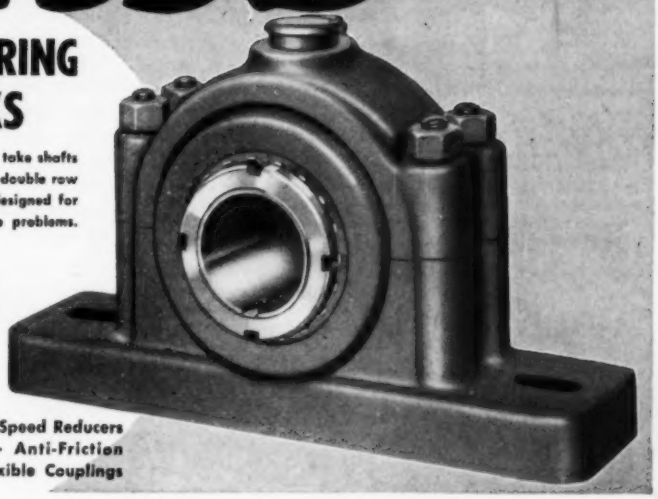


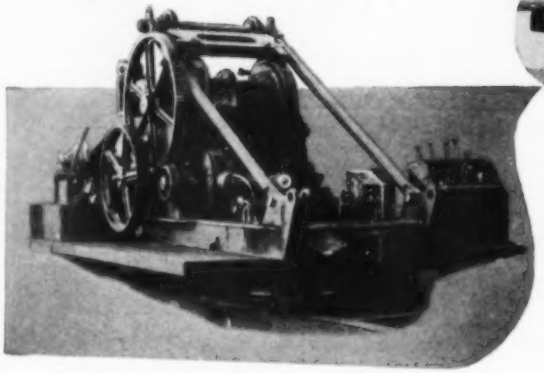
Herringbone — Worm — Spur — Gear Speed Reducers
Pulleys · Gears · V-Belt Sheaves · Anti-Friction
Pillow Blocks · Friction Clutches · Flexible Couplings

Wheel Mounting now adds

EXTRA CAPACITY and GREATER MOBILITY

to LIMA

Types 34 and 604



LIMA Type 604-M showing main machinery in position during assembly. Note hook roller construction and sturdy machinery base.

Truck-Mounted "Paymaster" also available

You can now also get the LIMA "Paymaster" (Type 34-T) in a truck mounted unit with separate engine for travelling between jobs at speeds up to 31 MPH. Crawler-mounted LIMA machines are available in Shovel capacities from ¾ to 6 yds., Cranes to 110 tons and Draglines variable.

Illustrated above is the LIMA "Paymaster" (Type 34-M) mounted on wheels to provide the advantages of better mobility and extra capacity where ground conditions permit its application. Two sizes are now available with wheel mounting —the "Paymaster" and the LIMA Type 604. Wheel mounted "Paymaster" has shovel capacities of ¾ or 1 yd., and crane capacity of 20 tons. Type 604-M is a 35 ton crane. (Capacities rated with outriggers supported). Type 34-M is readily converted to crane, shovel, dragline or pull shovel. In these units one engine powers all operations, including travel, and one operator controls them all from his cab. LIMA wheel mounted machines are ideal for many material handling operations requiring constant movement around the job. They will save travel time and reduce cost of moving machine between scattered job sites—often justifying the use of equipment on even the smallest operation.

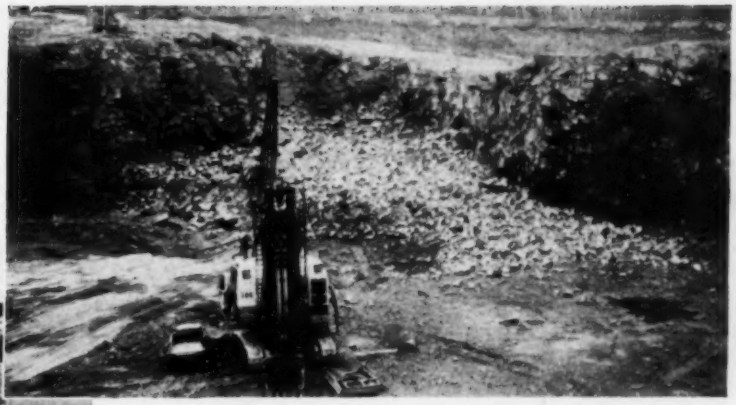
It will pay you to consult your nearest LIMA Sales Office or Representative before you buy your next shovel, crane or dragline. Offices in principal cities of the world.

Lima Shovel and Crane Division

LIMA, OHIO

OTHER DIVISIONS: *Lima Locomotive Works Division; Niles Tool Works Co.; Hooven, Owens, Rentschler Co.*

LIMA HAMILTON CORPORATION



Face showing loading operation. Drill holes approximate 85 feet, 9¼ inches in diameter. Burden averages 21.5 feet, spacing 26 feet.

Close-up of typical loading operation. "Nitramex" No.2, especially developed for bottom loading, gives additional strength needed to break hard-rock toe.

Wires are attached to Du Pont Blasting Timer set at .020 interval. Rotational firing creates a peeling action that reduces vibration and improves fragmentation. Secondary blasting is held to a minimum.

DAY-TO-DAY BLASTING PROVES ECONOMY OF DU PONT "Nitramex" No.2

Helps improve fragmentation . . . reduce secondary blasting

Operators of the Benson open pit Magnetite iron ore mine of the Jones and Laughlin Ore Co., Star Lake, N. Y., are using Du Pont "Nitramex"* No.2 in routine blasting operations. Their experience has proved the economy and efficiency of this blasting agent for better fragmentation and reduced secondary shooting.

The effective blasting plan adopted for a typical and difficult toe condition calls for bottom loading of "Nitramex" No. 2. This new-type blasting agent readily breaks up tough bottom rock. Its high density and slow pressure development result in a powerful spreading action . . . permit increased spacing, reduce drilling and blasting costs.

"Nitramex" No.2 retains all the safety characteristics of Du Pont "Nitramon."** It cannot be detonated by friction, falling objects, or even the impact of ball ammunition. But like "Nitramon," it is dependably detonated with a "Nitramon" Primer, itself relatively insensitive.

The remainder of an average load consists of Du Pont "Nitramon" and "Nitramon" Primers connected by Primacord and detonated with Du Pont Electric Blasting Caps. Split-second blasts, with the Du Pont Blasting Timer set at intervals of .020 second, peel the rock from the face, giving excellent fragmentation.

Ask your Du Pont Explosives representative to explain how "Nitramex" No.2 may help you to do a more efficient, more economical job of blasting. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

*Reg. trade-mark for ammonium nitrate blasting agent
**Reg. trade-mark for nitrocarbonitrate blasting agent

DU PONT

DU PONT
REG. U.S. PAT. OFF.

"NITRAMEX" No. 2

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BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

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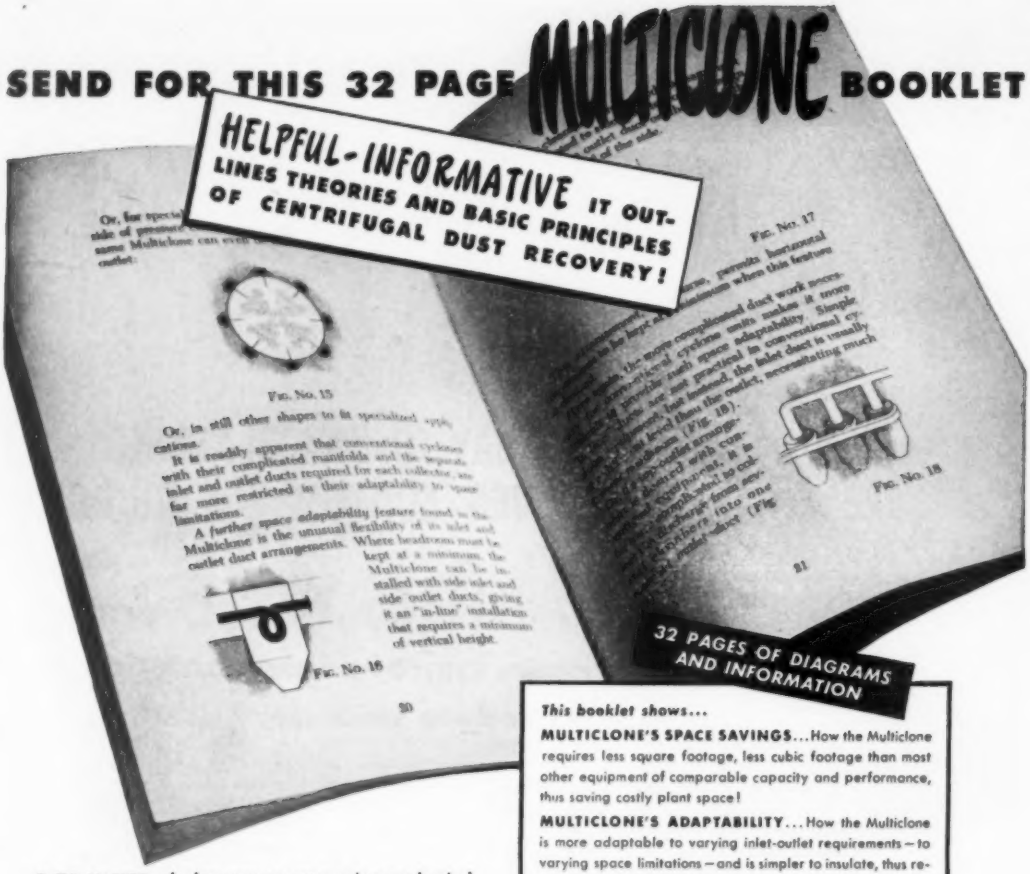
HELPFUL-INFORMATIVE IT OUTLINES THEORIES AND BASIC PRINCIPLES OF CENTRIFUGAL DUST RECOVERY!
Fig. No. 15
Or, in still other shapes to fit specialized application
It is readily apparent that conventional cyclones with their complicated manifolds and the separate inlet and outlet ducts required for each collector, are far more restricted in their adaptability to space limitations.
A further space adaptability feature found in the Multiclone is the unusual flexibility of its inlet and outlet duct arrangements. Where headroom must be kept at a minimum, the Multiclone can be installed with side inlet and side outlet ducts, giving it an "in-line" installation that requires a minimum of vertical height.
Fig. No. 16
30
Fig. No. 17
Fig. No. 18
31
32 PAGES OF DIAGRAMS AND INFORMATION

NO MATTER whether you are now using mechanical dust recovery equipment or are planning the installation of such equipment at some future date, here is a booklet that is full of helpful and valuable information on centrifugal dust recovery. It not only explains the basic methods and principles involved, but also shows the important differences between small and large diameter separating tubes, shows how to simplify your duct work and reduce installation costs, and outlines many other important factors to be considered in selecting mechanical dust recovery equipment.

In addition, this informative booklet illustrates and explains how MULTICLONE'S unique *vane* design is fundamentally different...how it makes possible greater compactness, simpler installation, high recovery of the small particles as well as the medium and coarser ones, and many other facts on MULTICLONE advanced design.

A limited supply of these booklets is available for free distribution to those interested in mechanical recovery equipment and methods. Write for your copy today.

This booklet shows...

MULTICLONE'S SPACE SAVINGS...How the Multiclone requires less square footage, less cubic footage than most other equipment of comparable capacity and performance, thus saving costly plant space!

MULTICLONE'S ADAPTABILITY...How the Multiclone is more adaptable to varying inlet-outlet requirements—to varying space limitations—and is simpler to insulate, thus reducing installation costs!

MULTICLONE'S EFFICIENCY...How Multiclone's multiple *small diameter* tubes, made possible by its exclusive vane design, give higher centrifugal forces and more complete cleansing of *all* suspended particles—even small ones of 10 microns and less!

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Make sure that a copy of this helpful booklet is in your reference files by sending for your copy now!

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3 OF MANY REASONS
Why Leading Contractors Prefer Lippmann Equipment

"LIPPMANN PULVERIZER IN OUR QUARRY DOES A 2-PULVERIZER JOB!"

says DeHart Brothers, Kearney, Mo.

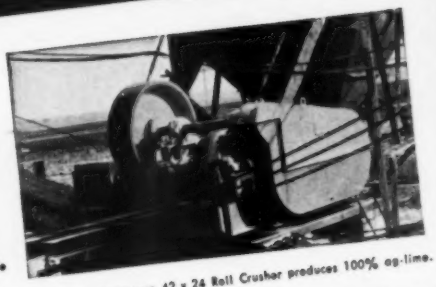
DeHart Pulverizer handles both quarry-run and over-size returns.

Look at the record of this 32 x 36 Lippmann Pulverizer at DeHart's Excelsior Springs quarry. Fed pit-run rock, from dust to 32 in., it produces 120 tons per hour "every hour of the day" of ag-lime "100% passing 8-mesh" without using all the horsepower the engine is rated to develop. After producing over 10,000 tons, DeHart has not even changed the hammer wearing surfaces.

Not only for ag-lime, but for road material, manufactured sand, coal or any friable material, there's not a machine made that can touch the Lippmann Pulverizer for high capacity, uniform cubical product, low maintenance and low first cost. Write for Bulletin 1160.

"LIPPMANN ROLL CRUSHER IS 100% BETTER THAN ANY OF THE SEVERAL OTHER MAKES WE'VE USED!"

says P. A. Bradbury, Aberdeen, S. D.



In Indiana, Lippmann 42 x 24 Roll Crusher produces 100% ag-lime.

And their letter continues, "Send us another 24 x 16 Roll Crusher *exactly* like the one we purchased Nov. 20, 1946." No wonder Bradbury Construction Co. wanted an exact duplicate of their Lippmann Roll Crusher — "In less than three years' operation, we produced 548,783 cu. yds. of gravel from hard rock . . . without any mechanical repairs. In fact, the rolls have never been taken apart, and only required building up the faces 6 times."

You, too, will find that Lippmann Roll Crushers save you money on repairs, minimize costly production shutdowns. Rugged construction, efficient operation, roll settings within 1/64 in. are reasons why you'll want to find out more about these profit-making machines.

"LIPPMANN SCREEN-ALL IS EVERYTHING WE WANT IN A VIBRATING SCREEN!"

consensus of Hundreds of Operators

Screen-Alls in tandem give mid-west quarry capacity, sharp sizing.

Yes, the Lippmann Screen-All, with its positive eccentric action and perfect circle throw, gives sharper sizing, greater capacities. Patented eccentric hubs and straight shaft design permits perfect counterweighting — no unbalanced forces give longer life, allow lighter substructures. New 3-point support simplifies leveling in the field. Placing bearings outside the screen body reduces headroom required. Quick-change Decks add flexibility for rapid changeover in case production must be shifted to ag-lime, stone, sand, etc. Get the full story. Write for your copy of Bulletin 1200 today.

2002
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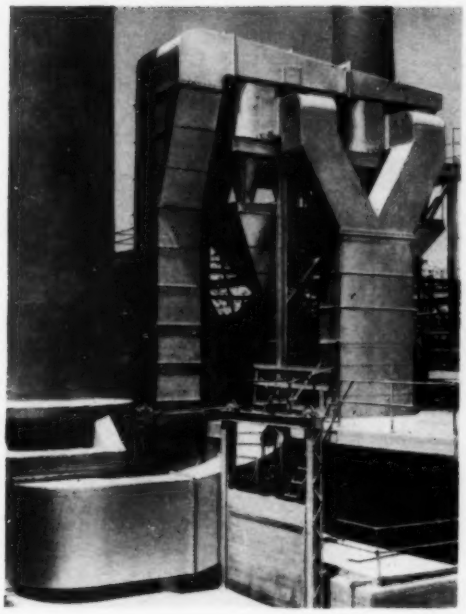
LEW

FOR ALL THE FACTS on the complete Lippmann line for pits, mines and quarries write for: Grizzly King Jaw Crushers (Bulletin 1100), Screen-All Vibrating Screens (1200), Pulverizers (1160), Belt Conveyors (1400), Gyro-Gnome Secondary Crushers, Circuit Rider Self-Propelled Crushing Plants, Portable Washing Plants, Apron Feeders (1450).

LIPPMANN ENGINEERING WORKS

4603 West Mitchell St., Milwaukee 14, Wisconsin

You can save every dollar's worth of Kiln Dust



Buell recovers more dust!

Returned dust needs no Pre-Processing!

BUELL RECOVERS MORE DUST—LESS ALKALIS!

High cyclone efficiency — assured by Buell's exclusive van Tongeren "Shave-Off"—boosts kiln dust recovery by tons. Harmless alkali passes through the collector. More "pure" dust is returned. No additional operation for alkali removal. The time and money Buell saves is quickly calculable!

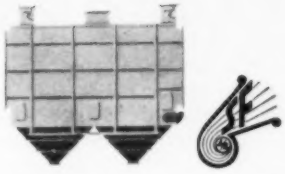
BUELL CYCLONES CAN'T CLOG!

The secret is in the cyclone diameters. They are large! Can't clog! Not even at the outlets. The result? All cyclones in a Buell System operate with uniformly high efficiency—without interruption!

BUELL SYSTEMS SHOW NO WEAR!

Even after 12 years, Buell Systems recovering dust from pulverizers, kilns and driers, still operate with practically no maintenance. Responsible for this record are large-diameter cyclones, made possible by Buell design, that cut the abrasive effect of rock dust to the minimum. Down to zero go shutdown and repairs!

Our engineers will gladly consult with you on your dust recovery problems. Write today to: Buell Engineering Company, 70 Pine Street, Suite 5055, New York 5, N. Y. No obligation, of course.



BUELL 'SF' Electric Precipitator

Kiln Dust Recovery may call for a Precipitator System, or one that combines both Cyclone and Precipitator. The Buell 'SF' reflects Buell's "Engineered Efficiency" in the collection and recovery of fine dusts, fumes and vapors.

buell

Engineered Efficiency in **Dust Recovery**

ROCK RATED!

THE NEW **P&H** MODEL 955-A (2½ YDS.)

with *MAGNETORQUE** swing

Watch this new machine get its teeth into a rock job and see what "rock-rated" really means to you. It's *designed* . . . every inch from boom point to crawler shoes . . . to make rock handling easier . . . more profitable for you.

Unbeatable—point for point

P&H Magnetorque eliminates swing friction clutches . . . their troubles and replacement costs. It gives you smoother, faster swings . . . for the life of your machine.

Greater Stability gives you more power at the tooth point . . . and greater work capacity.

Direct Acting Hydraulic Control . . . easier on machine, easier on operator . . . smoother and greater holding power through full wrap brakes and clutches.

P&H Rapid Reversing Planetary Chain Crowd gives you snappier dipper action. It's more accurate. And crowd chain outlasts 25 to 30 crowd cables.

Get the facts about P&H all-welded strength and Added Values! The 955A is a 2½ yd. version of the P&H 1055 (3 yd. shovel) . . . the machine that has set new low-cost production records everywhere. Write for Bulletin X122, today.

*Trade-Mark of Harnischfeger Corporation for electro-magnetic type clutch.

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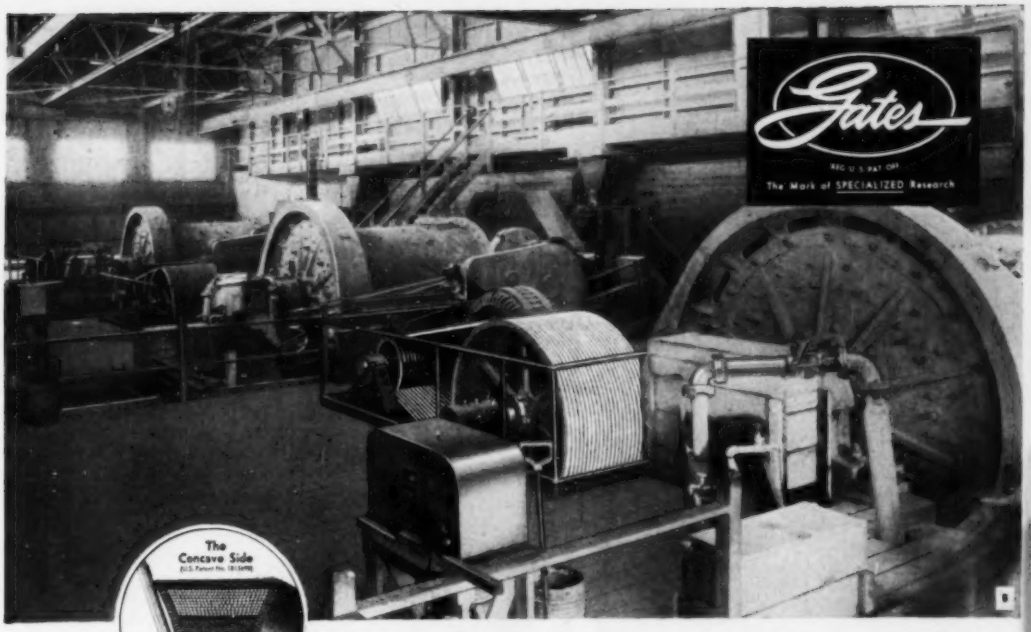


Profits of Bagdad Copper Corporation's isolated Arizona plant depended on maintaining economical and trouble-free operation. They chose the Gates Vulco Rope Drives (shown) for these big ball mills because of their proven ability to handle this rugged service. Also, because the failure of one belt would not necessitate a shutdown, but would give ample notice when a replacement set of belts was needed.

Let this simple test tell you exactly WHY the Concave Side cuts your V-Belt costs

To see for yourself the belt-saving importance of the Concave Side, just pick up *any* V-belt and bend it as it bends when it goes around a pulley.

As the belt bends, grip its *sides* firmly with your fingers. You will feel the sides of the belt *change shape.* This is because the top of the belt is under tension and, hence, grows *narrower* while the body, under compression, *bulges out.* (See figure 1 and 1-A)

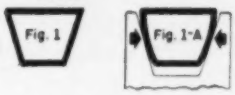
Now look at figures 2 and 2-A. There you see how the bending changes the shape of the belt that is built with the Concave Side —The Gates Vulco Rope. The concave sides of this belt merely *fill out* and become perfectly *straight.* There is no side-bulge. This belt, when bent, *precisely fits its sheave groove.*

A very distinct saving in belt wear results. No side-bulge means that the sides press *evenly* against the V pulley and therefore wear *uniformly*—resulting in longer life for the sidewall and, naturally, *longer life for the belt!*

If you care about cutting your belt costs, it will pay you to make sure, whenever you buy V-Belts, that you get the V-Belt with the Concave Sides...the Gates Vulco Rope!

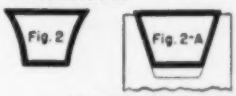
What Happens When a V-Belt Bends

Straight-Sided V-Belt



How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear at Point Shown by Arrows.

Gates Vulco Rope with Concave Side



The Concave Side Fills Out to a Precise Fit in the Sheave Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley—Uniform Wear—Longer Life!

CS-508

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DENVER, U.S.A.
World's Largest Makers of V-Belts

GATES VULCO ROPE DRIVES
Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U.S. and 71 Foreign Countries

An Indispensable Tool For Both Operator and Supplier of Equipment

The pit-and-quarry industries, in providing important basic raw materials, bear a large share of the responsibility for the success of America's industrial effort. For the producer the revised Technical Section of the 1950 Handbook provides a ready answer for many of his operating problems. For the concern supplying him with the machinery and equipment necessary to produce his materials, the 1950 Directory Section provides an accurate, up-to-the-minute list of all known producers of nonmetallic minerals and their products. No effort or expense has been spared to make the new Directory an efficient and highly useful source of information about producers. The number of changes made in the 1950 edition runs into the thousands.

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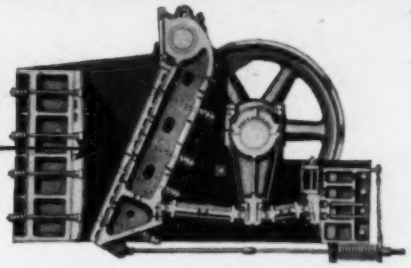
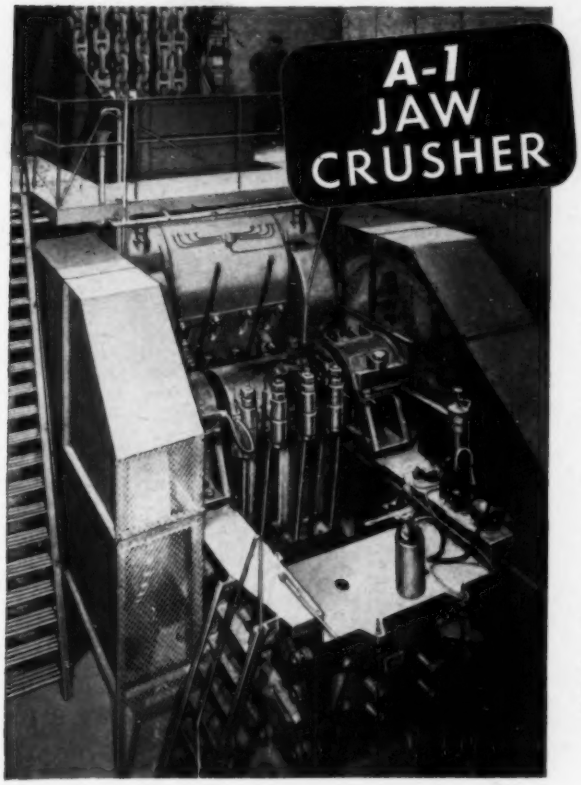
HERE'S THE JAW CRUSHER WITH THE

DEEP



Crushing Chamber



60 x 48 A-1 Jaw Crusher Installed Abroad.

THIS IS WHAT *A-1* jaw crusher's long, deep crushing chamber (up to 35% deeper than conventional crushers) means to you in terms of crushing performance and economy:

Big capacity — full-width receiving opening with acute crushing angle carried to top of crushing chamber permits nipping the largest pieces that can enter the receiving opening.

Less slippage — long jaw opening grips feed securely at top of crushing chamber. More acute jaw angle is especially effective in crushing tough, high compressive strength materials.

Uniform wear on jaw plates — curved plates distribute crushing action over greater surface, resulting in better economy.

CONSTRUCTION FEATURES

- ★ Renewable parts protect expensive castings from wear, greatly prolong crusher life.
- ★ Automatic lubrication of main, pitman and swing jaw bearings.
- ★ Jaw plates suspended from wearing plates, permitting free expansion of manganese steel.
- ★ Sectionalized construction permits ease of handling and installation.

The Allis-Chalmers representative in your area can show you how *A-1* jaw crusher may save money in your operations. Call him, or write for **Bulletin 07B6369B.**

ALLIS-CHALMERS, 974A SO. 70 ST. A-3190
MILWAUKEE, WIS.

A-1 and Texrope are Allis-Chalmers trademarks.

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Crushers

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KOEHRING HEAVY DUTY

7¾ to 79½ TONS lift capacity . . . ⅛ to 2½ yards dipper capacity

"You can't beat
Symons Cone Crushers
for secondary crushing . . ."

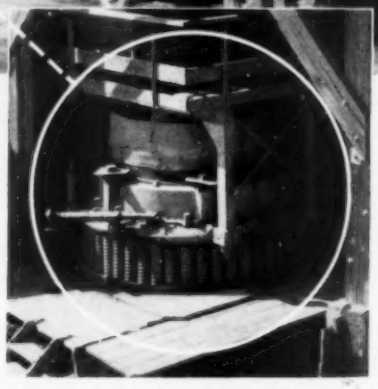
Consolidated Rock Products Company produces 350 tons of fine aggregate per hour with 3 SYMONS CONES

Consolidated Rock Products Company utilize one 7 ft. and two 4 ft. Symons Cone Crushers at their Sun Valley, California, plant, producing fine aggregate at a capacity of 350 tons per hour. Referring to this operation, the statement was made recently that Symons Cones could not be "beat" for secondary crushing.

The outstanding performance of Symons Cones in delivering a finer, more uniformly crushed product in greater capacities and at lower cost makes them the choice of experienced operators the world over.

Nordberg-built Symons Cone Crushers are available in Standard, Short Head or Intermediate types, with capacities ranging from 6 to 900 tons per hour. When you want to increase production of finer sizes, be sure you get a Symons Cone Crusher. Write for detailed information.

C504



● Here is a close-up of one of the three Symons Cone Crushers installed at the Sun Valley, Calif., plant of Consolidated Rock Products Co. This experienced operator has a total of 17 Symons Cones installed in several west coast plants.

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Machinery for processing ores and industrial minerals

MURPHY DIESELS
start instantaneously, even in the coldest weather

MURPHY DIESEL

IF you've ever gone through the cold morning ritual of starting ordinary diesels, you've got a surprise in store for yourself the first time you start a Murphy Diesel. Hot or cold she kicks off like a well kept automobile engine at just a touch of the electric starter lever. You don't need blow torches or tremendous patience to start a Murphy Diesel even at zero temperatures. In the words of John S. Wenger of Wenger and Sensenig, Paradise, Pa., *"The easy starting on cold mornings...leaves nothing to be desired."*

Right now, before the cold really sets in is the time to get ready. Have your Murphy Diesel Dealer give you full details on Murphy Diesel cold weather starting and the many other advantageous features of Murphy Diesel Power—or write direct.

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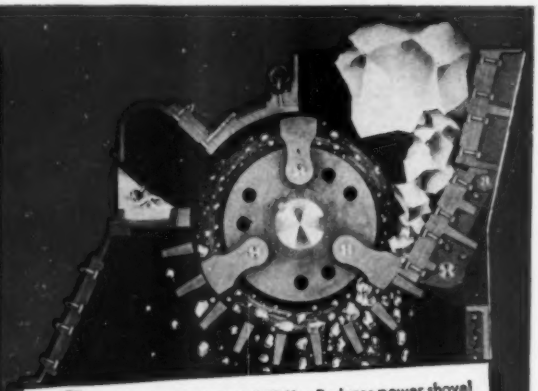
Heavy duty power

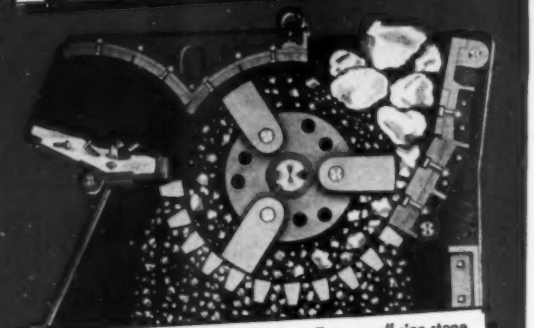
for rock crushing

24 models of Murphy Diesel Engines and Power Units for portable or stationary crushing plants, 90 to 220 H.P., 1200 and 1400 RPM. Generator Sets, 60 to 133 K.W.

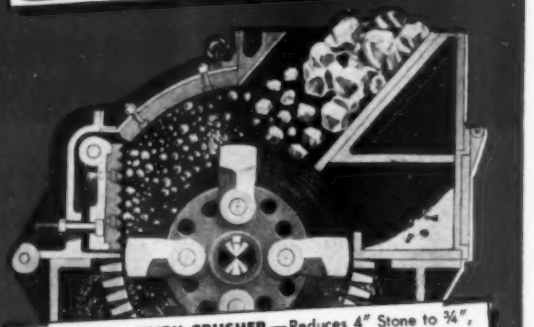
WILLIAMS HAMMERMILLS for the NEW 1-2-3 PUNCH in the CRUSHED STONE FIELD



1 The **"SUPER SLUGGER"**—Reduces power shovel loaded rock to 1½" or ¾" stone in One Operation. Capacities 65 to 550 tons per hour.



2 The **"SLUGGER"**—Reduces "one-man" size stone (75 to 100 lb. pieces) to 1¼", ¾" or Agricultural Limestone in One Operation. Capacities 4 to 100 tons per hour.



3 The **"NF" CRUSHER**—Reduces 4" Stone to ¾", ½" or Agricultural Limestone in One Operation. Made in a large range of sizes with capacities from 5 to 200 tons per hour.

You save operating costs because stone is crushed to desired size in one operation ... You save installation cost because you eliminate the need for additional machinery, foundations, conveyors, power drives and buildings.

WILLIAMS ALSO MAKES . . .

Impact and Roller Mills for 200 to 325 mesh grinding; drier mills; air separators; vibrating screens; steel bins; complete "packaged" crushing and grinding plants.

USE OUR FREE TESTING LABORATORY

Submit your grinding problems to Williams. A sample of the material and description of the desired result will set our facilities to work on a solution to your problem. Visits during test runs and technical consultations are invited.

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OLDEST AND LARGEST MANUFACTURER OF HAMMERMILLS IN THE WORLD

THERMALLOY* FEED PIPE can really TAKE IT!

Thermalloy feed pipe assembly employing angled design for special installation.

Thermalloy "47" feed pipe and support pipe, 16" diameter.

Thermalloy 12' long kiln feed pipe.

Stands up under abrasion, rough usage, heavy loads, high temperatures

If you're looking for longer service life from feed pipe and other kiln parts . . . investigate Thermalloy.

In scores of kiln installations, Thermalloy feed pipes have proved their ability to withstand elevated temperatures up to 2150°F without scaling or cracking.

Thermalloy feed pipes are available in a variety of designs—depending on method of support, relative position of hopper and kiln, design of kiln and size of pipe required. Let an Electro-Alloys engineer assist you in selecting the design and alloy best suited to your needs. Call your nearest Electro-Alloys office, or write Electro-Alloys Division, **2010** Taylor Street, Elyria, Ohio. *Reg. U. S. Pat. Off.

Specify THERMALLOY* for heat and abrasion resistance . . . CHEMALLOY* for corrosion resistance

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ELECTRO-ALLOYS DIVISION
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GREATER YARDAGE!
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Wellman Buckets cost less to maintain because they are ruggedly built. They deliver bigger payloads because they are properly designed. The superior engineering in Wellman Buckets gives the operator better balance, easier handling, cleaner digging. Wellman pioneered the unique construction that pays off in greater yardage at lower costs. There's a Wellman Bucket for every service.

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Looking for Used Equipment?

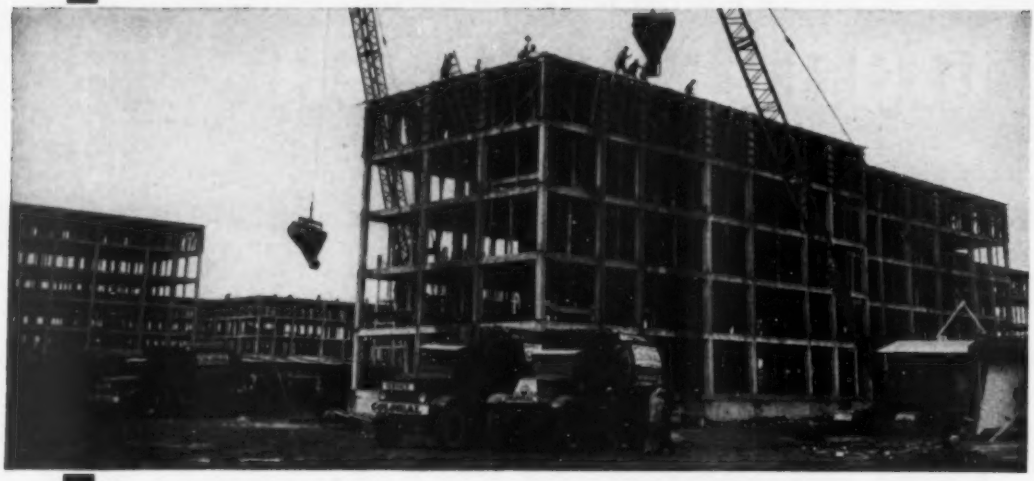
Refer to the listings in this issue for a wide variety of used and surplus machinery and supplies.

November 1950

THE CONCRETE MANUFACTURER

A SPECIAL SECTION OF PIT AND QUARRY

HERE'S WHY THEY ASK FOR 'INCOR'



High-Efficiency 'Incor' Performance

Speeds Erection of Ravenswood Houses—West Section

NEW YORK CITY HOUSING AUTHORITY
RAVENSWOOD HOUSES (West Section) Long Island City

Architect: **THE FIRM OF FREDERICK G. FROST,** New York

Ready-Mix 'Incor' Concrete
COLONIAL SAND & STONE CO., INC., New York

Contractor, Concrete Frame:
CAYE CONSTRUCTION CO., INC., Brooklyn, N. Y.

● One of New York City Housing Authority's largest projects is 2166-apartment Ravenswood Houses, Long Island City. Housing Authority projects are quality-constructed in every last detail—and they move ahead at driving speed. Because at today's costs, time saved is money saved—and how!

All last winter, frame concreting on the fourteen 6-story units in Ravenswood's west section clicked ahead on precise schedule—for CAYE CONSTRUCTION CO., INC. switched to 'Incor' 24-Hour Cement. In cold weather, column forms were stripped in 24 hours, slabs in 48 hours. That kept the job right on schedule—and saved a complete set of forms. *Big money, that, at today's form costs!*

Came Spring—and things were running so smoothly that they kept on using 'Incor'. For high-efficiency 'Incor' performance knows no season. Straight around the calendar, 'Incor' promotes the smooth-running, time-saving efficiency on which today's close-margin profits depend.

Another reason why the nation's leading Ready-Mix Operators make 'Incor'* concrete available at all times—for customers' time-and-money-saving convenience.

*Reg. U. S. Pat. Off.

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 27,500,000 BARRELS ANNUAL CAPACITY

NEWS OF CONCRETE MANUFACTURERS

Program Announced for S.E. Meeting of N.C.M.A. November 12-14 at Tampa

The following program has been announced by the National Concrete Masonry Association for its Southeastern Regional Meeting, to be held November 12 to 14 at the Tampa Terrace Hotel, Tampa, Fla.:

November 12 — Registration and get-acquainted period.

November 13 — Morning: Opening meeting, with G. W. Katterjohn (past president of N.C.M.A.) presiding; address by E. W. Dienhart, N.C.M.A. executive secretary, *Highlights of N.C.M.A.*; brief talk by R. E. McCarthy, Griffith-McCarthy Advertising Agency; *Advance in Modern Masonry*, George J. Votaw, architect, West Palm Beach; *Little Things That Count*, an address by Dr. Frank Goodwin, University of Florida.

At noon the session will be adjourned for luncheon at the J. L. Hart plant, followed by an inspection tour and a visit to the Hava-Tampa cigar factory, a sightseeing trip through Ybor City, McDill Air Force base, and Bayshore Drive. A cocktail party is scheduled at 6 p.m., and at 8 p.m. there will be a dinner dance.

November 14—Morning: Director M. N. Rinker presiding at the session. Addresses will be given by the following: S. H. Westby, assistant manager, Housing and Cement Products Bureau, Portland Cement Association; Richard Boone Rogers, architect, Orlando, Fla.; R. E. Copeland, director of engineering, N.C.M.A.; and Glenn C. Barnes, N.C.M.A. president.

After luncheon there will be a bus trip to the beaches, and in the evening "A Night in Havana"—including dinner, dancing and a floor show—has been scheduled in Ybor City.

Master Builders Becomes American-Marietta Affiliate

Further expansion in the chemical and building material field by American-Marietta Company through the acquisition of The Master Builders Company of Cleveland, O., was announced today by Grover M. Hermann, president of American-Marietta.

Founded in 1909, The Master Builders Company is a leading manufacturer of admixtures for concrete, metallic aggregates for hardening concrete floors, and protective coatings for concrete. Pozzolith, one of the company's patented cement admix products, is used as an ingredient in 20 percent of all the ready-mix concrete now being produced in the United States. Master Builders is also an important producer of chemical iron, a basic product used by the chemical and dye industries.

Master Builders operates plants in Cleveland, Buffalo, and Toronto, Ontario, and in leased facilities on the West Coast. Twenty-two branch offices for the sale of the company's products are maintained throughout the United States and Canada. Technical services are rendered by the company's large field organization to engineers, builders, and to the industries supplied.

Master Builders will be operated without any change as a fully-owned subsidiary of the American-Marietta Company, which is the country's sixth-largest paint producer and a substantial supplier of chemicals, adhesives, resins, and building products. S. W. Flesheim, who founded the company, will continue as president and Edwin L. McFalls, who joined the company in 1923, will continue as executive vice-president. F. J. Bates is secretary-treasurer, and Robert R. Kaufman is chief engineer. Directors, in addition to the above officers are E. W. Scripture Jr., Daniel Sherby, and B. R. Wood.

At a recent meeting of the Gene Olsen Corporation's board of directors Gene D. Olsen, who has been serving as the company's sales manager, was made secretary and assistant to the president.

Coming Events

November 13-14, 1950—Tampa. Southeastern Division meeting, National Concrete Masonry Association. Tampa Terrace Hotel.

January 22-25, 1951 — Cleveland. 31st annual meeting and exhibit, National Concrete Masonry Association. Cleveland Auditorium.

February 11-15, 1951 — New Orleans. 21st annual convention, National Ready Mixed Concrete Association. Roosevelt Hotel.

February 20-22, 1951—*San Francisco.* 47th annual convention, American Concrete Institute. St. Francis Hotel.

March 1-3, 1951—New York. 43rd annual convention, American Concrete Pipe Association. Waldorf-Astoria Hotel.

Perlite Institute Acts On Standardization, Names Brouk New President

The Perlite Institute met in St. Louis, Mo., at the Chase Hotel on September 14 and 15 and adopted further standardization of perlite plaster aggregate, as well as recommendations for the newly developed techniques of pouring perlite cement concrete with or without air-entraining agents.

The institute, now one year old, has 37 members representing 21 states. The remarkable growth of this industry was indicated by the report rendered by its architectural engineer, Wharton Clay, who stated that a survey of members' production made in March, 1950, must be raised for the entire year by 35 percent, making a total increase of 297 percent over 1949.

The following officers and directors were elected: president, J. John Brouk, Precast Slab & Tile Company, St. Louis, Mo.; vice-president, Kirk E. Hazelton, Cleveland Gypsum Company, Cleveland, O.; and secretary and treasurer, Wharton Clay, New York, N. Y. Directors include the following: Donald Gott, Great Lakes Carbon Corp., New York, N. Y.; Los Angeles, Calif.; S. Q. Johnson, Texas Panacalite Company, Dallas, Tex.; and Lewis Lloyd, Alatex Construction Service, New Orleans, La.

Irving Materials Company Opens Plant in Noblesville

One of the newest industries of Noblesville, Ind., is the plant of Irving Materials, Inc. which was opened in September. The plant is turning out ready-mix at the rate of about 300 cu. yds. per day.

According to Don Reed manager, the first few days of trial run operations produced more than 400 cu. yds. of concrete. It is expected, said Mr. Reed, that the plant will turn out enough concrete each day for about 25 new home foundations when full production is attained.

Tucson Block Firm Installs 5,000-Unit-per-Day Machine

At Tucson, Ariz., the Columbia Block Company has recently installed a new block machine with a capacity of 5,000 units per day. The owner is Jack Stewart, presently of the Davis-Monthan air base. Mr. Stewart's manager is Carl Shurtz.

In addition to the concrete blocks, the company is also manufacturing window sills, stepping stones, and capping blocks.

Eschenbrenner Awards For Engineering Papers Announced for 1951

The Eschenbrenner Awards, three annual $500 prizes for senior civil engineering students, have been announced by Universal Concrete Pipe Company at Columbus, O. Purpose of the awards is "to stimulate original thinking in the design, fabrication, and use of concrete products."

• Silver medallion received by winners.

The awards are open to all senior civils in recognized institutions east of the Mississippi, including the U.S. Military Academy, the U.S. Naval Academy, and the U.S. Coast Guard Academy. Papers must be submitted to the company by March 31, 1951, and announcement of winners will be made by May 15.

A jury of award, composed of prominent consulting engineers, will judge the entries on the following factors: ingenuity and originality; thoroughness of research, design, description, or procedure; practicability of the result and technical competence of presentation.

One $500 award will be made in each of three districts as follows: Central District—Ohio, Michigan, Indiana, Illinois, Wisconsin, Pennsylvania and West Virginia; Southern District—Kentucky, Tennessee, Mississippi, Alabama, Florida, Georgia, North Carolina, South Carolina, Virginia, Maryland, and the District of Columbia; and Eastern District—New York, New Jersey, Delaware, Massachusetts, Connecticut, Rhode Island, Vermont, New Hampshire, and Maine.

Rules for the program were drawn by deans of engineering at 20 colleges and universities. Advance copies are now obtainable from the company. In addition to their $500 checks, winners will receive engraved silver medallions.

'51 Concrete Industries Show Expected to Top '49 Exhibit

The seventh biennial Concrete Industries Exposition will be held in the Public Auditorium, Cleveland, O., January 22-25, 1951.

Sponsored by the National Concrete Masonry Association, the 1951 show will be held in conjunction with the association's 31st annual convention.

As in 1949 at Cleveland, the exposition and convention will be housed under one roof, with all activities headquartering at the Public Auditorium. Convention sessions will be held all four mornings in the auditorium's Music Hall, and the exposition will be open from 1 to 6 p.m. each of the four days. This arrangement provides ample time for attendance at meetings and the show without conflicts.

At the 1949 show registration passed the 4,000 mark, and present indications are that this record attendance will be exceeded next January. The Cleveland hotels are setting aside considerably more rooms for these important events than were available two years ago.

The 1949 Concrete Industries Exposition was so successful from every angle that the first 35 exhibitors to renew their application for space in the 1951 show took more than 80 percent of the total space originally planned. Space orders from individual exhibitors were frequently double and, in a few instances, triple the amount of space used in 1949. Those same 35 exhibitors, for example, had only 51 percent of the total space used two years ago.

As a result of this demand for space, it has been necessary to provide an additional exhibit area in an exhibit hall directly beneath the auditorium's Arena, where the 1949 show was held. At present there are only a few booths left in the Arena, and additional exhibitors are being located in the lower hall. Access to both exhibit halls, however, is from the same entrance to the auditorium building, the main lobby on Lakeside St., where all registration will take place.

30 Ready-Mix Concerns In 1949-50 Safety Contest Show Injury-Free Records

Brilliant injury-free safety records were chalked up by 30 of the 133 companies entered in the annual safety contest of the National Ready Mixed Concrete Association. The companies participating produced a total of 12,327,140 cu. yds. of concrete during the 12-month contest period that ended on July 1, 1950, and the fine safety record which they, as a whole, achieved should serve as a goal which all members of the industry ought to attain.

The contest was divided into three classes: Class A included companies which produced more than 100,000 cu. yds. of concrete during the contest period; Class B, 50,000 to 100,000; and, Class C less than 50,000.

In the Class A competition, the winner among 31 contestants was the Fort Worth Sand and Gravel Company, Inc., 700 East 6th St., Fort Worth, Tex. This company produced 189,413 cu. yds. of concrete during the contest period without a single injury to employees or non-employees, while working a total of 180,960 man-hours. During that period there were only three property damage accidents.

Two of the 33 companies entered in the Class B division came up with accident-free records. In accordance with contest policy previously established by the association's safety committee, the company with the greatest output of concrete and the highest number of man-hours was awarded the first-place trophy. Thus in this division Kuert Concrete, Inc., South Bend, Ind., winner of last year's Class A competition, was again declared the winner. In recognition of the fine accident-free record achieved by the Ebert Brothers Company, Wyandotte, Mich., in the Class B competition, a certificate of achievement in safety will be awarded to this firm.

There was a total of 27 companies out of 69 entered in Class C that presented accident-free records. In accordance with contest policy, the Fyfe Cement and Supply Company, Amarillo, Tex., was awarded the trophy. The other accident-free companies in this division will also be awarded Ceritificates of Achievement in Safety, in view of their superb records.

In addition, special recognition should be given the fact that four of the companies in the Class C division have attained especially outstanding safety records. Three of these, Randecker Brothers Company, Lock Haven, Pa., Wolf Ready-Mixed Concrete Company, Logansport, Ind., and the Portland Sand & Gravel Company, Portland, Pa., have maintained their accident-free records for the last two years. The other, the Trumbower Company, Nazareth, Pa., has not had an accident in the last three years.

The trophies will be presented to the winning companies by PIT AND QUARRY at the N.R.M.C.A. convention, which will be held in New Orleans next February. At this time the association will present all companies having accident-free records with Certificates of Achievement in Safety in addition to presenting all production and distribution employees of the three winning companies with Certificates of Accomplishment in Safety.

Vincent P. Ahearn, executive secretary of the association, emphasized that the safety information obtained from the individual company reports is in reality much more valuable than the actual determination of the winners. Safety, while good business for any industry, is especially important for the ready-mix concrete industry because these operations involve the constant use of the city streets and highways of the country. Unless the industry shows awareness of the importance of good public relations, and makes an effort to reduce or eliminate accidents, ready-mixed concrete operators will find themselves hampered by regulations which might make their operations unduly expensive or even impossible.

Although the 133 companies entered this year represented a nice increase over the 104 participants in the previous year's competition, Mr. Ahearn emphasized that every member-company should participate in the current contest. This can be done by merely submitting the enrollment form which will be issued to members next March, and then filling out and sending in the report which will be sent out next July. This report will cover the contest period from July 1, 1950, to July 1, 1951.

Businesslike Methods Feature Maine Ready-Mixed Concrete Operation

By WALTER E. TRAUFFER

Photo by permission of Portland Press Herald

• The attractive building housing the offices and testing laboratory of the W. H. Hinman Company and its subsidiary, Blue Rock Quarry, Cumberland Mills, Me.

WHEN officials of the W. H. Hinman Company of Cumberland Mills, Me., a suburb of Portland, in 1945 put in operation a new 100 t.p.h. crushed stone plant, they were not satisfied merely to make this a modern and efficient plant from a mechanical and production standpoint. Every effort was also made to apply the modern business and control practices used in its general construction work. A small but well-equipped laboratory was also built to serve not only its own construction needs, but also those of its subsidiary, Blue Rock Quarry. When, late in 1949, the latter company also put in operation a new and modern ready-mixed concrete plant, the same practices were extended to it and new ones were added. The laboratory was also expanded to meet the new needs. The company in 1945 also built a modern asphalt plant at its quarry.

The new ready-mixed concrete plant was officially put in production on July 12, 1949, when an open house was held for architects, contractors, state and local government officials, etc. It was successful from the start and demand has steadily increased. Deliveries are now being made within a radius of 35 miles, and the concrete is being used for residential construction, housing projects, small business buildings, schools, and municipal, public utility, railroad and other work.

The central batching operation is a complete Erie Steel Construction Company plant, equipped with all the latest production and control devices.

Crushed stone for this operation is hauled by truck from the nearby producing plant. Natural sand from outside sources is also hauled in by truck. These materials are dumped into a steel ground-level hopper, and a 76-ft. centers enclosed chain bucket elevator raises them to the top of the plant. They are discharged through a completely-enclosed chute to a three-way gate from which they can drop direct into the center compartment or through two short chutes into the end compartments of the 200-ton capacity Erie steel aggregate bin. The three aggregates being used at present are natural sand, and ¼- to ¾-in. and ¾- to ½-in. crushed stone.

Bulk cement is received in special 320-bbl. cars of the Maine Central Railroad, which has a spur track serving both plants. The cement is discharged to a screw conveyor, and a bucket elevator lifts it to the separate 450-bbl. bulk-cement bin. This has an Erie high-level bin level indicator which automatically shuts off the feed when the bin is full.

The Erie Aggremeter batcher set-up includes separate cement and aggregate weighing batchers. The 36-cu. ft. cement batcher is supplied from the bin through a rotary gate over an inclined screw conveyor. Air jets in the bin keep the cement flowing freely. The operator sets the poise on the beam scale at the desired amount and pushes a button to start the feed screw. An automatic photo-electric cell shutoff stops the screw when the desired amount of cement is in the batcher.

The 5-cu. yd. Erie aggregate-

• An action view of the ready-mix plant, showing cement being received in the bulk car (left) and concrete being loaded out into the truck mixer under the plant.

Photo by permission of Portland Press Herald

Figure 1

• Harley Hayes (left) is foreman, and R. W. Shields is manager of the Blue Rock Quarry.

weighing batcher is connected to a Howe dial scale with three spring markers which the operator sets to give cumulative weight readings for the three aggregates: sand, fine stone, and coarse stone. By means of lever-operated clamshell gates, the operator then runs the desired amount of each aggregate into the batcher in that order. The cement and aggregates are discharged into the truck mixers through a retractable spout adjustable for a mixer of any height. The spout is lined with rubber, which is giving very satisfactory service.

	5 Bag Dial Weights Plain	5 c.y. Darex
Sand	7200	6500
3/4 Stone	10265	9565
1½ Stone	16400	15700
Water	190	170
Darex		18 3/4 ozs
Cement	2350	2350

The company built its own water-measuring equipment which is working very well. Each truck mixer has a water measuring tank and for a time these did the measuring. The batcher told the driver the amount required for each batch, which he then measured in as the mixer drum rotated during loading. No time was lost in this process; the mixing and loading of a 5-cu. yd. truck mixer took less than 2 minutes.

The truck mixer fleet now consists of 5 T. L. Smith high-discharge mixers, three of 5-cu. yd. and two of 3-cu. yd. capacity, and two Ransome 5-cu. yd. high-discharge mixers. These are mounted on dual-axle and single-axle Mack truck chassis. Actually about 15 gal. of the measured mixing water is held back in the mixer tank so that the concrete arrives at the job fairly dry. The construction foreman there can add as much more of the 15 gal. as he desires, but if he wants more than the prescribed amount, he has to sign for it. About 95 percent of the concrete sold is mixed en route.

When the plant was visited late in 1949, it was being equipped for winter operation. Temperatures in this area drop as low as 40 degrees below zero in winter. A 450-gal. water-heating tank, of the instantaneous type with steam jets, was being installed. This was to discharge hot water to a measuring tank on the batching floor. Later a syphon-type unit was to be installed. Steam coils were being installed in the aggregate bins, steam to be supplied by a 50-hp. boiler.

The use of admixtures in this plant is confined to Dewey & Almy Darex air-entraining agent, which is added when specified. A dispenser of own design is used which consists of a 3-gal. bottle with a tube siphon leading to a 1,000-c.c. blood transfusion jar. The jar is marked in fluid ounces and when the proper amount is measured into it, the cock

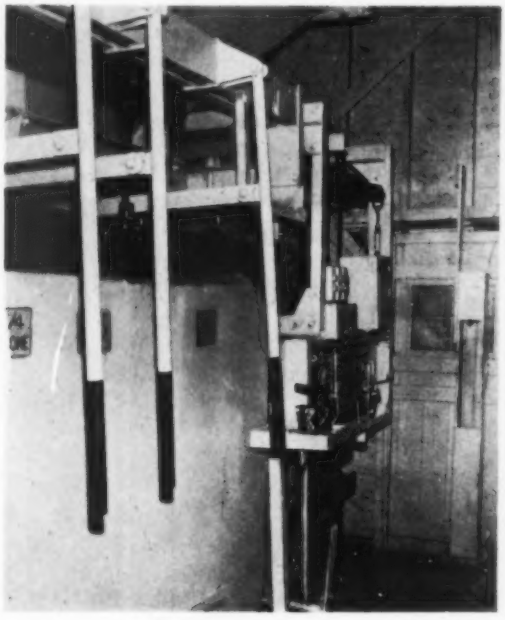


Photo by permission of Portland Press Herald

• The batching floor, with the aggregate weighing batcher at the left and the cement batcher at the right.

Photo by permission of Portland Press Herald

• One of the seven truck mixers which deliver the plant's products.

above it is closed and one below it opened to discharge into a container. The agent is then poured directly into the batch.

The mixes used in this plant were set by the Thompson & Lichtner Co. of Boston, Mass., under the supervision of Miles N. Clair, a leading authority on concrete design who has been a featured speaker at several conventions of the National Ready Mixed Concrete Association. From the information supplied, a card file was set up on the basis of bags of cement per cu. yd., for all batches from 1 to 5 cu. yd. by ½ yards. The weights on the cards are cumulative, so the batchman need only set the place markers on the scale. With cards for every conceivable mix including grout, topping, etc., there is small chance for error. Each card shows weights for both plain and air-entraining mixes, as shown in Fig. I.

A concrete sand moisture correction chart (Figure II) is also provided. The batcher takes the card for the mix and then adjusts for the moisture content of the sand only from this chart and sets his scales accordingly. Batch weights are corrected daily for moisture.

The laboratory is located in the office building at the entrance to the

CONCRETE SAND MOISTURE CORRECTION CHART

Design Wt. of Sand	1% Add Sand	1% Deduct Water	2% Add Sand	2% Deduct Water	3% Add Sand	3% Deduct Water	4% Add Sand	4% Deduct Water	5% Add Sand	5% Deduct Water	6% Add Sand	6% Deduct Water	7% Add Sand	7% Deduct Water	8% Add Sand	8% Deduct Water
4100	41	5	82	10	123	15	164	20	205	24	246	30	287	35	328	40
4200	42	5	84	10	126	15	168	20	210	25	252	30	294	35	336	41
4300	43	5	86	10	129	16	172	21	215	26	258	31	301	36	344	42
4400	44	5	88	10	132	16	176	21	220	26	264	32	308	37	352	43
4500	45	5	90	11	135	16	180	21	225	27	270	32	315	38	360	44
7600	76	9	152	18	228	27	304	36	380	45	456	55	532	64	608	73
7700	77	9	154	18	231	28	308	37	385	46	462	56	539	65	616	74
7800	78	9	156	19	234	28	312	37	390	46	468	56	546	66	624	75
7900	79	9	158	19	237	28	316	37	395	47	474	57	553	67	632	76
8000	80	10	160	19	240	29	320	38	400	47	480	57	560	67	640	77

Figure II

yard and is compact yet complete enough for the needs of the affiliated companies. A Central Scientific air determination meter and a Marshall stability machine were recently added, as well as a 150,000-lb.-capacity Yoder compression testing machine.

In this laboratory sand is tested as soon as it is received for sieve analysis, organic impurities, and moisture content. Coarse aggregates are checked daily for sieve analysis, wear, and specific gravity. On large pours, 6-in. cylinders are taken at the site at least once a week. Periodically, cylinders are also made from various mixes. At present check cylinders are being broken at the laboratory of the University of Maine.

A daily concrete report (Figure III) is made out which is designed to give ready and accurate information on all mixes turned out that day, giving destination, time, cumulative yardages, etc., and making

Figure III

Weather Report Condition
7 a.m. FAIR
12 Noon "
3 p.m. "

BLUE ROCK QUARRY

DAILY CONCRETE REPORT

Date AUG 5, 1949

HAULED TO	TRUCK NUMBER	MIX	Ticket Number	Time Out	Time In	Trip Time	Cu. Yds.	Cu. Yds. Today	POUNDS CEMENT	POUNDS SAND	POUNDS ½in. STONE	POUNDS 1½in. STONE	REMARKS DAREX
SEWALL WOOD PRODUCTS	3	5	1199	8:20	10:00		5	5	2115	6800	8900	—	16 7/8 lbs
E. SCHLICHTER	5	6	1200	8:50	11:00		2	7	1128	2390	1260	2520	9 "
SEWALL WOOD PRODUCTS	2	5	1201	9:15	11:05		5	12	2115	6800	8900	—	16 7/8 "
SEWALL WOOD PRODUCTS	3	5	1202	10:00	11:55		5	17	2115	6800	8900	—	16 7/8 "
SEWALL WOOD PRODUCTS	1	5	1203	10:55	12:35		5	22	2115	6800	8900	—	16 7/8 "
SEWALL WOOD PRODUCTS	2	5	1204	11:55	1:10		5	27	2115	6800	8900	—	16 7/8 "
SEWALL WOOD PRODUCTS	3	5	1205	12:—	1:50		5	32	2115	6800	8900	—	16 7/8 "
CITY OF PORTLAND	5	5	1206	12:40	1:55		3	35	1410	3900	1839	3681	11 1/2 "
SEWALL WOOD PRODUCTS	1	5	1207	12:55	3:10		5	40	2115	6800	8900	—	16 7/8 "
CITY OF PORTLAND	4	5	1208	1:10	1:50		3	43	1410	3900	1839	3681	11 1/2 "
SEWALL WOOD PRODUCTS	2	5	1209	1:20			5	48	2115	6800	8900	—	16 7/8 "
SEWALL WOOD PRODUCTS	3	5	1210	2:10			5	53	2115	6800	8900	—	16 7/8 "
CITY OF PORTLAND	5	5	1211	2:05			3	56	1410	3900	1839	3681	11 1/2 "
CITY OF PORTLAND	4	5	1212	2:45			3	59	1410	3900	1839	3681	11 1/2 "
SEWALL WOOD PRODUCTS	1	5	1213	2:55			5	64	2115	6800	8900	—	16 7/8 "
NORTHEAST BUILDERS	5	6*	1214	3:20			3	67	1128	4320	1770	3585	9 "
CITY OF PORTLAND	4	5	1215	3:45			1	68	470	1950	919	1840	5 3/8 "
NORTHEAST BUILDERS	3	4	1216	4:00			5	73	1880	7200	2950	5975	15 "
SEWALL WOOD PRODUCTS	2	5	1217	4:25			3	76	1260	3900	5520	—	12 "
NORTH EAST BUILDERS	2	84	1218	4:45			2½	78½	940	3600	1475	2987	7½ "
									90 BAGS	36½ T	55 T	15½ T	± 2 GAL

REMARKS		BBLS CEMENT	TONS SAND	TONS ½in. STONE	TONS 1½in. STONE	DAREX-GAL
RECEIVED CHC # ME. 47126 11:25 AM	MATERIAL ON HAND A.M.	1833	664½			28 3/8
NO SAND HANDLED	MATERIAL RECEIVED	3325/8	NONE			
	MATERIAL USED	90	36½	55	15½	
	BALANCE ON HAND	3560½	627 5/8			
	DAREX USED					2
	DAREX ON HAND					26 3/8

OFFICE PROCEDURE ON CONCRETE CALLS

1. Order taken from customer by man at switchboard on order form, pink original, blue duplicate.

2. Call scale operator at concrete plant and relay order.

3. Original order to Shields for scheduling.

4. As soon as practicable, BLUE order sent to scale operator.

5. When orders are called directly to scale operator by customer the scale operator must relay the information to the switchboard operator to be placed on the regular form.

6. When necessary, orders will be C.O.D., and well marked so that the scale operator will immediately recognize them.

7. Green copy of concrete loading slip will be returned by driver to office at the completion of each delivery with the customer's signature thereon.

8. At end of each day, BLUE order slips together with YELLOW LOADING slips, will be returned to office by scale operator for matching with the signed GREEN customer's copy previously returned by driver.

9. Questions of credit on orders taken from new unknown customer will be handled as follows:

Order for concrete will first be taken, type, quantity, location of job, etc., and price will be given. The operator will then ask, "Do you wish for our driver to collect from you at the job?" If the customer declines to give his o.k. to this arrangement, the telephone operator will give the call to Mr. Coots, who will handle the situation by explaining our policy regarding new accounts. If the customer still refuses, R.W.S. will be notified and a check made by him on the standing of the customer; if found to be O.K. the loading slip will not be stamped C.O.D., and the concrete will be issued on credit. If, however, the customer's credit is questionable, R.W.S. will call customer on telephone or see him, so that there will be an understanding regarding payment, before concrete leaves the plant.

10. On small-volume estimates, on walls, floors, etc., the telephone operator will endeavor to arrive at an approximate figure of cubic yards required, so as to help make a sale, but in general must have R.W.S. check the quantity, and he will call the customer back with more detailed figures if necessary.

11. Large-volume estimates will be given after looking over the site, and if thought advisable, some price adjustment made in order to secure the order.

PROCEDURE TO BE FOLLOWED BY SCALE OPERATOR AT PLANT

1. Scale operator to receive order from telephone operator and will enter customer's order, mix, delivery date, etc., in day book.

In case of orders telephoned directly to scale operator, he will relay order to office for entry on regular form.

2. Scheduling of trucks to be done by R.W.S. each p.m. and to be given to scale operator at 7:00 a.m. the next morning for each day's deliveries. In case of orders requiring immediate delivery the scale operator may work them in if in his judgment the planned schedule will not be seriously altered. In each instance, however, he must check with R.W.S. as soon as practicable.

3. Scale operator will make out loading slips. Green and blue loading slips will be given to driver. The yellow loading slips will be returned to office at end of day, together with yellow telephone order slips. These slips must be matched up with day book entries by scale operator in order to eliminate errors.

4. When trucks are hauling to private property and there is reason to believe that damage may be caused by trucks while making deliveries, the scale operator will use the "Property Damage" stamp to stamp the "Green" office copy which will be returned to office by driver at the completion of delivery.

C.O.D. orders will be marked by stamp by scale operator, who will be informed as to amount when given order by office. All three copies of loading slip will be stamped.

5. Information on batch weights and water required for truck loadings will be given to scale operator by R.W.S. each morning.

possible a quick inventory of materials on hand. The report for any day is used the following day in the office to check delivery slips against the control sheet, thus eliminating any possibility of error in sorting slips or billing.

Orders for concrete are received by telephone in the office and written up in duplicate. The original copy goes to the superintendent for scheduling, the duplicate goes to the plant, where there is a separate clip for each day in the week. From these copies, loading slips are made out and specific directions for delivery are given to the driver, who turns it in to the office on his return.

In the office these telephone order slips are matched with the plant loading slips and the concrete report. Billing is done every day. A quotation record is kept so that checkbacks can be made, and the weigh-

PROCEDURE TO BE FOLLOWED BY DRIVER WHEN DELIVERING CONCRETE

1. Driver receives BLUE and GREEN loading slips from scale operator after receiving his load.

2. At job site driver has GREEN copy signed by customer or his representative. If waiting time is involved, customer must sign for it after unloading is done.

Care must be taken that none of the waiting time charged for is due to fault of driver.

3. If additional water is added to concrete for purposes of easy handling, it shall be at the direction of the customer or his representative and must be signed for on the back of the GREEN loading slip.

4. If there is a possibility of damage to driveways or yards when delivering concrete, the driver will have the back of the GREEN SLIP SIGNED ON THE PLACE PROVIDED BY THE PROPERTY DAMAGE STAMP before setting truck into position.

5. Driver to leave signed GREEN loading slip at office at the completion of each trip. Also, to return any moneys received from C.O.D. payments.

master has a daily record book in which he records every conversation with the office. (For details of procedure followed, see three accompanying instruction sheets.)

A calculation has been made of the cost to the company of each mix listed, this being set up on the basis of crushed stone bought at retail from the affiliated company. The

(*Continued on page* 180)

N. R. M. C. A. Directors Vote Sun Valley Ideal Meeting Place

By WALTER E. TRAUFFER

THE board of directors of the National Ready Mixed Concrete Association turned out in full force to participate in the mid-year meeting at Sun Valley Lodge, Sun Valley, Idaho, on Monday, September 25, 1950. Of the 21 board members 17 were present and most of them brought their wives and other members of their families. The board of directors of the National Sand and Gravel Association met on Tuesday and there was a joint meeting on Wednesday. There were the usual important business meetings and the added pleasures of a resort which in the opinions of those present has no superior. From the standpoint of scenery, accommodations, food, service, recreational facilities, etc., Sun Valley leaves little to be desired.

In a brief introductory address William Moore, president, pointed out the excellent financial condition of the association and commented on the importance of maintaining its splendid representation in Washington. Mr. Moore also stated that the present membership totals 435, a gain of 53 since January. He introduced the new directors: R. S. Barneyback (Henry J. Kaiser Co.), Henry J. Brown (The Cook & Brown Lime Co), Walter M. Keeler (The Walt Keeler Co., Inc.), H. M. Lacy (Dallas Concrete Co.), Elbert F. Lewis (F. D. Lewis & Son), and Robert Mitchell (Consolidated Rock Products Co.).

B. F. Devine (Chain Belt Co.), chairman of the Truck Mixer Manufacturers Bureau, was unable to be present due to illness; so Wayne W. King (W. S. Tyler Co.) spoke for him. Mr. King said that the manufacturers were very much pleased with the attendance at their exhibits in Chicago and with the interest shown. Stanton Walker, director of engineering, pointed out that the bureau is constantly revising its standards so that they will not become obsolete.

A brief report on the ready-mixed concrete safety contest was also given. The enrollment was the largest in the history of the contest. While results were generally good, there was one fatal accident in the enrolled plants. A complete report of the results of the contest is presented in the news pages of this issue.

• Ready for the barbecue—Mr. and Mrs. W. J. Doyle Jr. (Tulsa Sand Co.); Mr. and Mrs. J. B. Donovan (Valentine Concrete Co.); and Gene M. Mason (Concrete Materials Co.).

• Evidently enjoying the barbecue were Frank L. Kelly (Colonial Sand and Stone Co.); William Moore (J. P. O'Connell Co.), president of N.R.M.C.A.; and Robert C. Collins (The Warner Co.).

• Mr. and Mrs. Harold M. Lacy (Dallas Concrete Co., Dallas, Tex.).

Robert F. Porter (Harry T. Campbell Sons Co.) described the group insurance plan his company has followed since 1935 with excellent results. Norman J. Fredericks (Koenig Coal & Supply Co.) said that his company has had a life insurance plan since 1927 which has since been expanded to include sickness and accident benefits, etc. The proposed association plan is designed to make this type of insurance available to companies which are too small to have their own plans. The board voted to send a letter ballot to all members to find out whether any appreciable number would be interested in such a plan.

At the joint meeting of the two boards on Wednesday, September 27, the program for the annual conventions in New Orleans was discussed. The dates are February 12 to 15, 1951; the place, the Roosevelt Hotel. The tentative program presented and approved by the two boards is briefly as follows: executive committee meetings of the two associations on Saturday, February 10; on Sunday a visit to the Jahncke estate north of the city, where one of the features will be a real Southern barbecue; on Monday, February 12, meetings of both boards, with a joint luncheon at noon.

The first day of the actual convention will be Tuesday, February 13, and it was suggested that there be a joint general session in the morning with the sand-and-gravel operating meeting in the afternoon, and possibly a simultaneous round-

• Mr. and Mrs. H. F. Thomson (Material Service Corp., Chicago) and Mr. and Mrs. H. P. Caldwell (Ohio River Sand Co., Louisville, Ky.).

• Enjoying the barbecue—Mr. and Mrs. N. J. Fredericks (Koenig Coal and Supply Co.) and Mr. and Mrs. Herbert Jahncke (Jahncke Service).

table discussion on financial and legislative matters. It was proposed that a joint session be held on Wednesday morning, to be devoted to a roundtable on emergency regulations. There would be a joint luncheon, followed by the N.R.M.C.A. operating session in the afternoon and a simultaneous meeting on merchandising problems in the sand-and-gravel industry. Thursday, February 15, would be the closing day for both groups, with a sand-and-gravel meeting in the morning and one for ready-mix in the afternoon.

Herbert Jahncke (Jahncke Service) has been working very hard on the entertainment program, and Mrs. Jahncke has been planning arrangements for the ladies; it is apparent that this convention will be one long to be remembered. On Monday there will be a luncheon for the ladies in the French Quarter. On Tuesday there will be escorted tours of the many beautiful and historic old homes and gardens. On Wednesday there will be a joint luncheon to which the ladies are particularly invited, at which the mayor of New Orleans will probably be the speaker. Late that afternoon there will be a four-hour boat tour of the harbor, with a buffet supper on board. There will also be a bar, orchestra, and dancing. Many other side trips will also be available to those attending. The Manufacturers' Division wishes to sponsor a reception as in past years and is leaving the decision on this up to the association boards. Sam Fowlkes of the New Orleans convention bureau said that the five-day limit on hotel rooms is still in force, but that it will be waived for this convention. Mardi-Gras will be over on the preceding Tuesday, and convention-goers can be accommodated as early as Thursday of that week.

It was also announced that the 1952 convention will be held at the Stevens Hotel, Chicago, either the week of February 23 or March 3, with the crushed stone convention also taking one of these dates. The 1953 convention in San Francisco has been tentatively scheduled for the week of February 22, but an effort may be made to secure a later date. The 1954 location will be either Chicago or Cleveland; and invitations have been received for the 1955 meetings from Boston and Miami.

Vincent P. Ahearn, executive secretary, speaking before the joint meeting, gave a general picture of government actions already taken and other moves in prospect during this national emergency. He said that we are now on the outskirts of a military economy and that allocations and other restrictions may be expected at any time. He advised producers to get their plants in the best possible shape so that they would be able to meet any demands which a war effort might impose on them. Mr. Ahearn predicted that there will be some curtailment in the demand for aggregates and ready-mixed concrete in 1951 and that controls will probably go into effect after election day. He also declared that price and salary controls will probably be more rigid than wage controls.

The Association's *Drivers Manual* was reported to be nearly ready for distribution. Each member company will receive one copy and can purchase more for distribution. With respect to the Short Course to be held this year, the prospects are for a large attendance. It has been found necessary to restrict the course to member companies only. It was also learned that at the regular Fall meeting of the American Concrete Institute to be held in Washington on October 25 and 26, there will be a special session on ready-mixed concrete. Stanton Walker will be chairman of a panel of experts who will answer questions. Local ready-mix producers will also participate in this panel.

Robert C. Collins (Warner Co.), chairman of the merchandising committee, facetiously remarked that this group now calls itself the cement procurement committee. He said that the capacity of the cement industry in 1951 is expected to be nearly 8 million barrels higher than in 1950 because of the many plant expansion programs in that industry which have either been completed or are well under way. The board voted to pass a resolution from the ready-mix industry asking the cement industry for a proportionate share of the cement produced, pointing out the importance of this industry as a user of cement. Members from all parts of the country told of conditions in their areas and almost without exception reported that the shortage is serious, in some cases holding plants down to less than one-half of the demands imposed upon them.

Stanton Walker reported that the new laboratory is in full swing and that a large number of important investigations are under way. These are too numerous and detailed to report fully here but include such subjects as studies of admixtures; freezing and thawing tests; concrete design procedures; absorption tests; field tests of air-entraining mixtures; thermal coefficients, etc.

Officials of the Monolith Portland Cement Company have announced the removal to the firm's new operations headquarters at 3326 San Fernando Road, Los Angeles 65, Calif., of the accounting, engineering, operating, purchasing, sales, and traffic offices.

The Design and Engineering Of Steam Curing Installations For Concrete Block Plants

By WILLIAM J. SHORE, M.E.

Part I

INTRODUCTION

THE manufacture of cinder and concrete block units is, comparatively speaking, a new industry. Actually, it is only a matter of a generation or so ago that it was a backyard industry. Today it supplies an important and essential building material. The growth of this business has been phenomenal, and it appears that new methods, new developments, new uses and new techniques of application will make this an industry which will produce better structures at less costs for labor and materials. And the materials will be of uniform quality and sold at prices that reflect modern improvements in manufacturing procedure.

It is only within recent times that the use of steam for curing block has come into prominence. It is true that here and there one finds a blockmaker who will have nothing to do with steam for curing, believing that the best blocks are those that have stood in the open air for a period of at least 28 days. Very few blockmakers today will tie up nearly $200,000 in stocks of blocks in process of curing. But there are such cases.

At the other end of the scale are the blockmakers who have invested huge sums of capital in autoclave high-pressure curing systems to produce a better quality of blocks.

It seems probable that between these two opposing techniques for curing block there is a means of steam curing which will develop quality block of excellent appearance and high early strength test.

It is possible to make complete curing installations, including curing kilns and doors, steam boiler plant, and installation, for from $15,000 to $20,000 per 1,000 standard 8-in blocks produced hourly. Such an installation is ample for a block production of 16,000 blocks per day (operating two 8-hour shifts).

THE BLOCKMAKING BUSINESS

Blockmaking is like no other type of business. There are manufacturers who operate successfully on a production of 1,000 blocks per day; others produce up to 50,000 and even more blocks per 24-hr. day.

This business can be started with relatively little capital outlay and in

William J. Shore

a matter of four to five years the operator can sometimes point to an investment of $150,000 free and clear, and still in first class condition to continue making blocks.

Because of the high degree of skill and engineering incorporated in blockmaking equipment, it requires but little proficiency on the part of the blockmaker to turn out top-quality blocks. This, however, does not apply to the problem of steam curing blocks. Most kiln equipment and steam curing equipment are mainly improvisations. They are put together somewhat on the order of children's play. Most steam curing installations are still in the primitive stage of development.

Actually, the steam curing process is a highly technical and scientific problem. Were we to enumerate the various types of skill required to assemble a steam curing plant, we would be engaging the services of mechanical, civil, and transportation engineers, a chemist, and a chemical engineer.

Despite the lack of technical knowledge on the part of the blockmakers, it is remarkable to note the degree of effectiveness with which most steam curing systems function.

It is the purpose of this article to cover the entire subject of steam curing, except chemical considerations, and to make it possible for intelligent blockmakers to plan and make the installation of their steam curing systems with full assurance that blocks will be properly steam cured in the most efficient and effective manner.

The information and data offered is based upon experience in the field and has been collected in great measure from actual installations. Since in this field, at least up to the present moment, results are largely empirical, no attempt is made to attain extreme accuracy and precision. For safety's sake all figures given are on the conservative side.

The making of cinder and concrete blocks is subject to many highly disconcerting vagaries. Variations in daily temperature and humidity are important. Aggregates vary in quality and wetness; cinders vary, especially where there is no mountainous stockpile to last for a year or so.

All blockmakers aim to get as many blocks per bag of cement as they possibly can without taking the chance of falling below prescribed strength. This is so because cement is one of the major elements in block costs.

There is difference among experts in this field to such a degreee that the average blockmaker makes every effort to find out for himself what is good and what is bad, and goes on from there. It is to the credit of the regular blockmakers that they have been able to deliver to their customers blocks of first quality in appearance, strength, and dryness.

It is to these blockmakers that this article is directed. They may not agree with all points brought forth, but there is good reason to believe that many will find the answers to their problems relating to steam curing in the discussion and presentation offered herewith.

Steam Curing System In essence, a steam curing system comprises at least one curing kiln and a steam generating system with means for introducing

direct steam or radiated steam heat into the kiln or kilns.

The Block Curing Kiln Steam curing kilns may be anything from a barn or a house cellar to a magnificent concrete structure built to last for centuries. Because a good kiln is so cheap to build, there is no good excuse for not enjoying the benefit of well designed and well constructed kilns. No real block production can ever be achieved with inadequate or inferior kiln construction.

CONSTRUCTION METHOD

Actually few concrete block curing kilns are properly constructed. A kiln is simply an enclosure over a solid concrete floor. A kiln does not have to have heavy walls and sides. Only in cold climates does it have to have a roof structurally strong enough to carry a snow load. The most important element in any kiln is the matter of insulation.

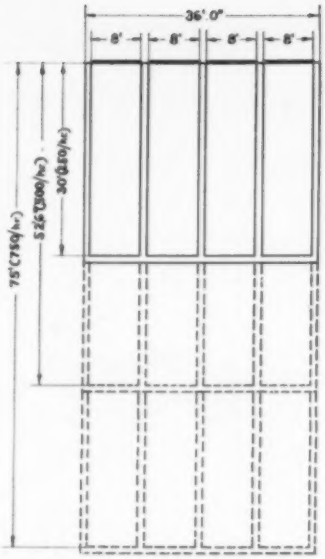
The curing kiln, in addition to being structurally sound and insulated against loss of heat, must also be water tight from the inside and outside. Its materials must be corrosion-proof and acid-vapor-proof. It must also be fitted with doors which meet these requirements and which can be shut tightly.

Kilns so built will prove most economical in cost of operation; and further, they will permit the maintenance of uniform quality of production, the assurance that every block, day after day, will be perfect and sound throughout.

As a matter of fact, the construction of a kiln should have been planned long before the concrete floor is put down. Most kilns are built from a finished floor, and that is an error.

Most block kilns are now built to allow for three rows of racks. This is fundamentally wrong, because a kiln holding two rows of racks proves more effective for a curing cycle. A kiln with two rows of racks lengthwise has a roof span of but 8 ft. and a concrete roof for this span is lighter than a roof for a 13-ft. span, which is required for three rows of racks.

Common practice is to pour a solid concrete floor slabs, and then build walls of 8-in. block to a height of 7 ft. 6 in. and then pour a reinforced 6- or 8-in. roof slab. These materials are available to blockmakers and are therefore perfectly proper. Yet, they omit essential materials that should be incorporated in the construction of block curing kilns.



• Sketch showing an outline of a kiln design for the production of 250, 500, and 750 8-in. units per hour.

INSULATING METHOD

It is commonly known that the floor of any steam curing kiln is always much lower in temperature than the roof section. The reason for this is partly because heat rises, but also because of loss of heat through the floor slab into the ground. To offset this it is necessary to excavate an additional 3 in. and pack the ground with a layer of coarse diatomaceous earth for a depth of 3 in. On this should be laid the concrete floor slab. If provisions can be made to put two insulating expansion joints in this floor slab, it will reduce the danger of breakage through expansion and contraction due to extremes of temperature.

For all dividing walls between adjacent kilns no insulation is needed, since any heat passing through walls warms the adjacent kilns with the blocks to be heated.

Outside walls, however, should be insulated. A layer of 2 in. of any insulating material, either rockwool or glass fiber in bulk form, may be installed between the outside wall and another wall of 4-in. block. This insulation is ample to meet normal requirements.

The roof slab should be covered with sheet insulation of fiber glass (1 or 2 in. thick) against loss of heat through the roof. Before placing insulation on the roof, however, the slab should be given a three-layer coating of roofing felt, coated with pitch, and then on top of the insulation another three layers of roofing felt. With this type of construction, full assurance may be had of obtaining the best possible results in the curing process.

Benefits of Insulation Here are the benefits derived through good insulation on kilns:

- Reduced fuel consumption
- Less time to reach full heat
- Slowly decreasing temperature after heat is shut off
- Less water in kilns
- Improved quality of curing
- More uniform heat distribution through kiln
- Higher temperatures with minimum quantity of steam

NUMBER AND SIZE OF KILNS

(In all calculations involving blocks, the standard 8-in. unit is selected for all examples. Where mentioning racks for blocks to be loaded into kilns, we include the 34-in. wide by 83-in. long rack with four tiers, holding a total of 72 blocks. For other sizes of racks and blocks proper compensating adjustments should be made.)

A plant may have one, two, three, or four curing rooms and up to as many as 20 kilns. There is no standard practice on kiln size, although the kiln accommodating three rows of racks appears to be fairly popular, where racks are set lengthwise.

The practice of loading an 8-hr. output of blocks into one large curing room and applying steam to the entire lot is a wasteful process, as will be brought out further on.

The ideal method is to start the steaming process as soon as possible after the first kiln is loaded and from then on apply it to each of the following kilns in succession as it receives its allotted load of blocks. This routine will require a boiler plant of the smallest capacity and also the smallest amount of steam for curing.

Advantages of 2-Row Type We recommend the use of a two-row type of kiln for these reasons:

- A roof with an 8-ft. span requires less concrete than one for a 12-ft. 6-in. span, and is therefore more economical.
- 8-ft. doors for kiln closures are no more costly per square-foot opening than 12-ft. 6-in. or 13-ft. doors. With a minimum weight of 3 lbs. per sq. ft., the 8-ft doors weigh about 180 lbs.,

while the 12-ft. 6-in. doors weigh 300 lbs. Smaller doors are always easier to handle.

Timing factors for groups of four kilns per battery, for loading, setting, steaming, soaking and curing, and unloading are much easier to work out than odd figures. Four kilns operating per 8- or 16-hr. shift lend themselves to more precise scheduling.

Less heat is lost from roofs, side and rear walls, floors, and doors of kilns; hence for the same amount of steam consumed, there will be a more rapid temperature rise, more blocks heated, less water in the kilns, and less water on the blocks.

Economy in Heating Cycle By heating one-fourth of the total block production every 2 hrs., we get away with the minimum size boiler equipment. As a homely illustration, we might consider a load of 4 tons to be lifted by a hoist. If we split this up into four parts, a one-ton hoist is sufficient. If we plan on lifting the entire 4 tons at once, we require a 4-ton hoist. It is precisely the same with boiler size.

If we split our kilns into four and apply heat for 2 hrs. each, we have radiation losses, that is loss of heat from each of four kilns for 2 hrs. each. If we do the job in one batch (which will require four times as much time, namely 8 hrs.), we will have radiation losses from the four kilns for 8 hrs. each, or four times the loss. A curing kiln assembly should therefore consist of four kilns. This assembly, or battery permits a satisfactory curing cycle based upon one or two 8-hr. working shifts per day.

Kiln Size and Production Volume The width of such a battery is 36 ft. 4 in. (Two outside walls 1 ft. 2 in., three inside walls 8 in. each and four kilns 8 ft. each across.)

The length of a battery of kilns may be 30 ft. for a 250-block-per-hour output, 52 ft. 6 in. for 500 blocks per hour, or 75 ft. for 750 blocks per hour.

For production in excess of 750 blocks per hour, it is recommended that a new battery of kilns be started, rather than increase the length of the first battery. Where inside kiln lengths are greater than 75 ft., the time consumed in making the long runs becomes a burden. Based on two 8-hr. working shifts per 24-hr. day, one 75-ft. battery can cure 12,000 blocks per day; two can cure 24,000; three, 36,000; and four, 48,000.

Dimensions of Curing Kilns for Various Capacities.

Hourly Rate of Block Production	Number of Kiln Batteries	Number of Kilns	Interior Length of Kilns (Feet)	Block Production per Two 8-hr. Shifts
250	1	4	30	4,000
500	1	4	52.5	8,000
750	1	4	75	12,000
1000	2	8	52.5	16,000
1500	2 or 3	8 or 12	75 52.5	24,000 24,000
2000	4	16	52.5	32,000
3000	4 or 6	16 or 24	75 or 52.5	48,000 48,000

The unique feature in the design of these kilns is that the small manufacturer can increase kiln capacities merely by lengthening the walls at moderate cost.

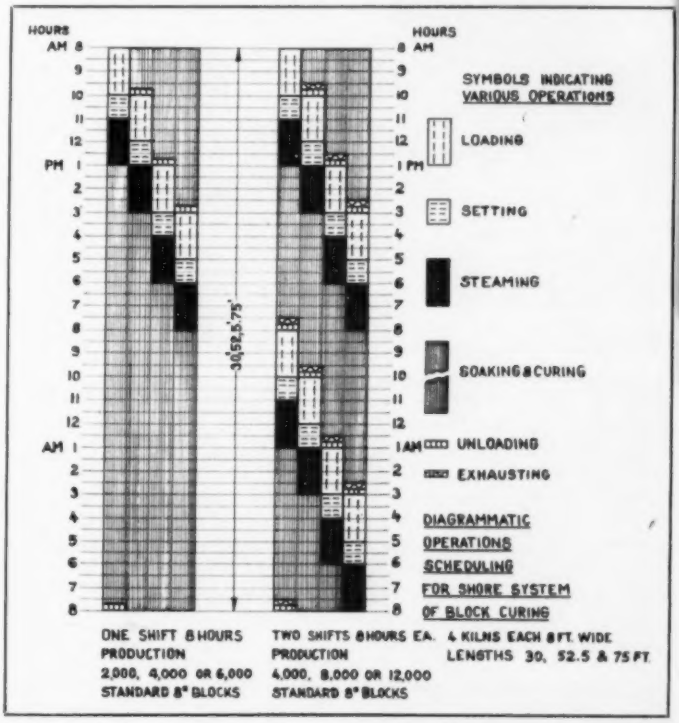
The area required for curing space, per 1,000 blocks, is as follows: operating one 8-hr. working shift, 400 sq. ft.; operating two 8-hr. working shifts, 200 sq. ft.

The normal curing cycle applied to the above kilns, but based upon one 8-hr. shift, is as follows: loading, 2 hrs., setting time, 1 hr., steaming time, 2 hrs., soaking and curing, 18.5 hrs., and unloading, ½ hr. Total, 24 hrs. For two 8-hr. shifts per day, the above times would remain the same, except that soaking and curing time would have to be reduced to 9.25 hrs.

Compared with much of the common procedure now universal, the steaming time has been reduced, but the soaking and curing times have been increased.

CURING PROCEDURE AND MANUFACTURING OPERATIONS

The relation between curing procedure and manufacturing operation is largely a matter of cycling operations in such a way that no two operations will overlap. Consider the steam cycle. This should coincide with or be less than the time required for loading and setting. If not less, it is apparent that two or more kilns will be requiring steam. This therefore demands a larger steam plant than really necessary.


HOURS
AM 8 9 10 11 12 PM 1 2 3 4 5 6 7 8 9 10 11 12 AM 1 2 3 4 5 6 7 8
30'52.5'75'
HOURS
8 AM 9 10 11 12 1 PM 2 3 4 5 6 7 8 9 10 11 12 1 AM 2 3 4 5 6 7 8
SYMBOLS INDICATING VARIOUS OPERATIONS
LOADING
SETTING
STEAMING
SOAKING & CURING
UNLOADING
EXHAUSTING
DIAGRAMMATIC OPERATIONS SCHEDULING FOR SHORE SYSTEM OF BLOCK CURING
ONE SHIFT 8 HOURS PRODUCTION 2,000, 4,000 OR 6,000 STANDARD 8" BLOCKS
TWO SHIFTS 8 HOURS EA. PRODUCTION 4,000, 8,000 OR 12,000 STANDARD 8" BLOCKS
4 KILNS EACH 8 FT. WIDE LENGTHS 30, 52.5 & 75 FT.

• Diagram showing the curing cycle for a battery of four kilns operated on one and two 8-hr. shifts per 24-hour day.

yes, you can

Buy or Lease

this Universal Concrete Pipe Machine

★ You needn't lay out the purchase price to begin enjoying the production and profits of this great machine. Leasing arrangements are possible on terms that assure profitable operation. The Universal Pipe Machine has set new higher standards for efficiency. It makes more pipe and better pipe with fewer man hours. Because it true-tamps at the incredible rate of 680 strokes-a-minute, you use a drier mix, get stronger pipe that handles with less damage, requires minimum curing. One of the four sizes (5"-24", 6"-48", 12"-60", 24"-72") will meet your requirements. Ask about the *Universal Lease Plan.*

UNIVERSAL CONCRETE MACHINERY CO.
297 South High Street Columbus, Ohio

otherwise the work will be slowed up, since curing lags behind production and does not maintain the pace of production.

One disturbing factor in the past has been, that no matter how much steam was fed to a kiln, it still took longer than the time limit to bring blocks up to heat. That was due partially to the low temperature of low-pressure steam. Today this inherent faulty condition is overcome through the use of a more effectively insulated kiln, and also the use of high-pressure steam. (This is discussed more fully under the heading of "Steam.")

Since a temperature rise of 40 deg. per hr. is permissible, it is possible with proper equipment to carry out the steaming operation in a matter of 2 hrs. Thus it is evident that since steaming can be accomplished in less than loading time, the steam generating equipment will never have to supply steam to more than one kiln at a time.

Steam requirements for cement and cinder or lightweight blocks are practically the same. The lighter weight of the cinder block offsets the increased temperature required for curing. Concrete blocks do well at 160 deg. F., and cinder blocks are satisfactory when heated to 180 to 190 deg. F.

Curing Cycle In the diagram on page 177 the entire curing cycle for a battery of four kilns operated on one and two 8-hr. shifts per 24-hr. day is depicted.

Kilns are 8 ft. wide, holding two rows of racks, four kilns per battery, designed for hourly block production of 250, 500, and 750 per hour. The varying kiln lengths provide for the different capacities. For any production of over 750 blocks per hour, a new battery of kilns is recommended, length of kiln depending upon production increase anticipated.

This typical battery of four kilns is good for daily productions of 2,000, 4,000 and 6,000 blocks for one shift, and double this number for two shifts.

In the operating cycle for one 8-hr. shift block loading begins at 8 a.m., and is complete by 10 a.m. One additional hour is allowed for early set of the concrete. Steam is turned on at 11 a.m.; thus the average time for setting is 1.5 hrs., or from 1 to 3 hrs. per block. A steam supply is allowed to pass into the kiln in sufficient amount to bring blocks up to the proper maximum temperature in a matter of 2 hrs. It is turned off at 1 p.m.

Blocks are then allowed to soak and cure till 7:30 a.m. the following morning, when they are unloaded and the above cycle is repeated. The times allowed are normal and will produce a well cured block.

(While the time for steaming in the cold winter weather is increased, it does not affect overall results because the production of blocks is generally half that of summer conditions.)

It is at once apparent by studying the drawings that steam is only on one kiln at a time. In this way we obtain maximum capacity and service for any steam generating equipment we have installed.

In the operating cycle for two 8-hr. shifts, involving one battery of four kilns 30, 52.5, and 75 ft. long, it is possible to steam cure 4,000, 8,000, and 12,000 blocks per 24-hr. day.

The operating cycle is precisely like that for one-shift-per-day operation except that the soaking and curing time is reduced to 6.5 hours. From the time that the kiln is loaded to the time that its contents are removed, the blocks stay in the kiln a total of 12 hrs. Actually this is twice the time allowed in many of the larger block plants to steam cure blocks. Naturally the block does not get as good a treatment as the block that stays in the kiln 24 hrs.

In making use of kiln capacity two times in 24 hrs. a vapor condition is created which requires the installation of an exhausting and cooling system. When blocks that have been heated up to high temperatures are brought out into an atmosphere of lower temperature, an unbalance occurs, and the greater part of the hot moisture covering the blocks becomes converted to vapor, which enters the working shed and produces a dense fog. To overcome this condition to a great degree, it is possible to cool the blocks with outside air and in the process draw off the vapor to the outside.

This exhaust system is unnecessary where blocks are left in the kilns for 24 hrs., because by the time they are removed, they have cooled down to ambient temperature. The longest soaking and curing periods in the kilns produce the highest grade of uniformity and quality of product.

(To be concluded next month)

Purchase of the Colorado Concrete Manufacturing Company at Colorado Springs, Colo., by Ralph J. Watson for about $50,000 was announced recently. The firm has been supplying the area with concrete sewer and drainage pipe, grease traps, meter pits, and blocks for 38 years.

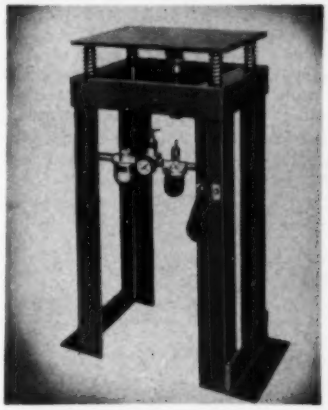
Don't Hand Up a Hammer— Hang Up a Vibrator

By J. J. BECKER
President, Cleveland Vibrator Co., Cleveland, Ohio

ONCE upon a time keeping stubborn concrete materials moving so that they wouldn't plug or arch in hoppers, bins, chutes, screens, and other materials-handling devices was a major problem. It was usually solved by the questionable means of the heavy hand, a hammer, a little well-placed profanity, or a let's-start-all-over attitude.

No need to do so today. The use of air vibration equipment in the industry has been increasing steadily, with handlers finding more and more ways to move materials by this method. Over a quarter of a century ago the Cleveland Vibrator Company, one of the pioneers in this field, developed an air vibrator which found wide application in the foundry industry. Continued research since that time has developed a wide range of applications in many other industries.

Recent development in the form of specially designed units find certain types of air vibrators being used in the following ways: (1) to vibrate concrete forms of all kinds, from steps, lintels, and pipe, to concrete burial vaults; (2) for the even, smooth spreading of concrete on sidewalks; (3) to move cement out of covered hopper railroad cars; (4) to loosen and speed the flow of stubborn materials from bins and hoppers; (5) for cleaning pallets; (6) on trucks used for hauling cement; (7) as supplementary vibrators attached to the tamper head of block machines; (8) in the form of vibration tables for producing miscellaneous concrete products; (9) to give extreme density to large slabs for low-cost housing construction; (10) as external vibration in the production of concrete culverts and dam structures of superior quality. Perhaps this article will suggest some ideas on how *you* can use such equipment.



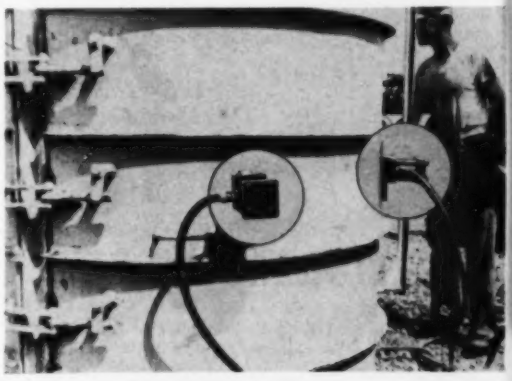
• Vibrators are well adapted to a wide range of vibrating tables for the production of various precast concrete products.

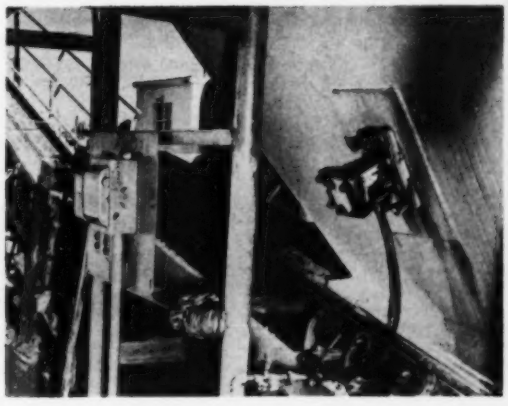
The piston is the heart of the vibrator. It is thrown from one end of the assembly to the other by compressed air pressure built up through the air intake and the drilled porting of the piston. On some of the smaller vibrators this piston travel exceeds 5,000 vibrations per minute. An important feature of air vibration, however, is that vibration speeds can be controlled and varied according to the requirements of each particular application.

Speed and intensity of vibration is controled by (1) size of the piston, and (2) applied air pressure. All Cleveland air vibrators, except the springless type, are equipped with a compression spring for starting. On installations where the vibrator is mounted in a vertical position or up to 30 degrees from vertical, the spring can be taken out, and the piston allowed to drop by gravity.

Air vibrator parts must be manufactured to close tolerances, and the wearing surfaces must be plated to assure long life. Pistons on the Cleveland vibrators have hard chrome plating applied electrolytically to the base metal, and all the small parts are heat-treated in Carbon-Itriding furnaces to achieve scale-free hardening.

Cleveland makes a type and size of air vibrator for almost every conceivable application, at present having available some 29 mountings and 14 piston diameter sizes which are capable of producing a wide range of vibration intensities. Whether gentle persuasion is called for or heavy-hammer-like blows, there is a vibrator to suit the task. A few of the many applications in the concrete industry are illustrated in the accompanying photographs.





• Right: Air vibrators in place on the outer walls of a 48-in. diameter concrete pipe form.
• Below, left: Here a portable type vibrator is being placed on the hopper of a cement car to facilitate unloading.
• Below, right: A common application is on feed hoppers over conveyors to facilitate the flow of material.

Businesslike Methods

(*From page 172*)

price for each mix is based on this method, which has worked out very well. A price sheet is made up which lists the prices of mixes of from 4- up to 8-bag cement content to individuals, contractors, towns, etc., with provisions for lower prices for volume orders. Additional delivery charges are listed separately on the basis of 10 cents per mile over 5 miles.

The company misses no bets in its sales efforts, trying to get in as early as possible on each project to point out the advantages of ready-mixed over job-mixed concrete. All local leads are followed up, and the company also subscribes to the F. W. Dodge Corporation bulletins for information on jobs to be let in its area. Information on such jobs is entered in a loose-leaf book, leaving space to write in information on job contacts. These projects are also spotted with red pins on a large detail map of the marketing area. When Blue Rock gets the order for concrete on a job, a blue pin replaces the red one.

The company does considerable newspaper advertising, stressing quality and service. A point is made of the fact that the quality of its product is backed up by one of the most nearly complete laboratories and one of the best technicians in the business.

William H. Hinman is president of the W. H. Hinman Co. and of the affiliated Blue Rock Quarry. Philip V. Corey is general manager of the W. H. Hinman Co. and treasurer of Blue Rock. R. W. Shields is manager of Blue Rock, and Charles F. Parker is chief engineer of both companies.

CHALLENGE MIXERS *Pour Specification* CONCRETE *for...*

Delta-Mendota Canal near the termination point at Mendota, California. Central Valley Project, U. S. Bureau of Reclamation.

U. S. BUREAU OF RECLAMATION

Here is a picture that speaks volumes...Challenge-Mixed concrete being used on a U. S. Bureau of Reclamation job* in California. Probably no other customer is as particular as the "U. S. Bureau"...slump, proportions of the materials, and uniformity of the mix **must be exact!**

George Thompson, President, Thompson Materials & Construction Company, who are supplying the concrete, said: "U. S. Bureau Engineers have been high in their praise for the Challenge Mixers". It provides the exact slump concrete; the open end permits thorough inspection of the concrete before it is poured; and with the Challenge, it is easier to control the mix.

Don't wait...act now! Get acquainted with this modern, streamlined, truck mixer that **pours toughest jobs at lowest cost.**

Cook Bros. Equipment Co.,
Los Angeles, California

Send me complete information on Challenge Mixers delivered in my area. Also the location of my nearest dealer.

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COOK BROS. EQUIPMENT CO.
Exclusive National Distributors For
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the modern, streamlined truck mixer

1815 No. Broadway, Los Angeles 31, Calif. Phone: CApitol 2-9111

American Industrialist Offers President Aid for Koreans

A few weeks ago President Truman received a most unusual letter from a patriotic American citizen, William M. Chase, owner and operator of the Chase Concrete Machinery Company of Buffalo, N. Y. Mr. Chase was not making a request for a favor; he didn't want anything. He was offering Mr. Truman 250 new concrete block machines for the Korean government, so that this war-torn land might have the equipment for rebuilding some of its ruined cities.

According to Mr. Chase's letter, a copy of which he sent to our office, he offered the machines, freight prepaid to any Atlantic seaport.

Mr. Chase explained to the President that although these new machines, built in 1948, but never used, are obsolete in this country, due to the more streamlined and labor-saving models made soon after these came out, the equipment would be most useful in Korea, where labor costs are low and assembly-line production is not the rule. Mr. Chase also made his offer to the U. S. Army Engineers in Tokyo.

British Specialist Writes Volume on Concrete Fences

Written by an experienced manufacturer with a good deal of experience in the field, *Concrete Fences*, by A. M. Pennington, describes in detail the design, the materials used, and the methods of production and erection of many common (and some uncommon) types of concrete fences. Complete with many dimensioned drawings, photographs, and tables, the book is written for those responsible for the erection of the fencing, as well as for the manufacturer of concrete products.

The 66-page volume includes many clever ideas for the design production of concrete fencing and has an appendix which covers methods of determining sizes of posts and quantities of reinforcement for fences which are subject to wind loads. It also includes sections on proportioning concrete, molds, reinforcement, inserts for fixtures, estimating given jobs, and fence erection. Concrete Publications, Ltd., London, England.

NEW MACHINERY and SUPPLIES

● Hydraulic Press

A 100-ton hydraulic press made by the Budd Development & Manufacturing Co., P. O. Box 4581, Cleveland 24, O., is claimed to exert a crushing force in excess of 200,000 lbs.

Designed to test concrete blocks for given strength requirements, the device reportedly makes it possible for the producer to cut down on the quantity of

cement. Tests have proved that at least four more 8-in. units can be made from each bag of cement if blocks are tested regularly with this press.

The opening of the machine is 13 in. high, and top and bottom platens measure 12 by 16 in. Concrete blocks and ready-mix cylinders of all sizes can be tested for compressive strength in a few minutes.

● Bulk Cement Handling

"Ready-Flow" bulk cement handling systems, manufactured by the W. S. Nott Company, 2nd Avenue, N., and 3rd Street, Minneapolis, Minn., is featured as a means of direct saving to the concrete plant operator, who is able to accept bulk shipments with this equipment.

Metal-framed canvas shrouds control the flow of cement from car hopper discharge openings into the screw conveyor inlets between railroad tracks. Weatherproof metal covers seal the inlets, and an additional sealed cover inlet is provided between the tracks and the elevator to accommodate a boxcar-unloading hopper. Smooth helicoid screw flighting is suspended at 10-ft. intervals by white iron bearings with hangers of open-framed rigid steel design. The conveyor trough is of welded steel with angle construction to provide rigidity and assure alignment. Trough ends are of cast iron

Extra help on toughest Mass Handling jobs.
Extra man-hours saved. Extra fast moving, loading, stacking, transporting.
Extra profit for you!

It will cost you nothing extra to learn how Towmotor *Mass Handling* makes every materials handling job easier, faster, safer. For complete information, write for your copy of "Handling Materials Illustrated." Towmotor Corporation, Division 13, 1226 E. 152nd St., Cleveland 10, Ohio. Representatives in all Principal Cities in U. S. and Canada.

THE ONE MAN GANG

Arrange now for a private showing of this 30-minute sound movie on Materials Handling. See how Towmotor effects startling reductions in production costs. Ask for complete details at no obligation.

TOWMOTOR
THE ONE-MAN-GANG ®

FORK LIFT TRUCKS and TRACTORS

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

with dust- and moisture-proof seals.

By means of a baffle in the trough surging is prevented and the flow is controlled. The design of the screw conveyor permits the use of a right-hand screw flight from the track to the elevator, as well as a left-hand screw flight from the silo to the elevator. One drive and one trough carries cement in both required directions.

The screw conveyor is driven by a compact weather-proof drive consisting of a totally-enclosed fan-cooled Reliance ball bearing electric motor, a Michigan cone drive speed reducer, and Morse DRC flexible couplings and roller chain drive. The screw conveyor is available in any required length up to 40 ft. in one continuous conveyor. Screw feeders are provided for installations where gravity feeding is not possible.

The Nott company also makes a system designed for plants not located on railside sites. Such an installation is recommended for operators who require temporary facilities.

Triple-welded all-steel silos are fabricated and shipped in one piece. Silos are available for both ground-level applications and elevated on H beams. For special installations knock-down silos are furnished. Standard daily-use bins of 50-bbl. and 100-bbl. capacities are available in rectangular and round shapes.

Discharge from silo to screw conveyor is controlled by means of a rotary plug valve. Linkage to the lever control at the operator's station allows simple regulation. The same valve is used to control feed into the weigh batcher.

Both stationary and trolley cement batchers are available in various sizes, with accurate and fast dial-type or beam-type scales. Two-compartment combination cement-and-aggregate weigh batchers can be furnished.

Aerating systems to provide a uniform and steady flow of cement from silos, hoppers, and chutes are available. Bin level indicators and air compressors can be supplied, or existing air compression equipment can be used with a reducing valve inserted to lower pressure in the air line to 5 p.s.i.

Elevator buckets are high-speed, heavy-gauge perforated steel, permitting filling and total unloading at the right position. The head section mounts a 30-in. steel pulley with the shaft on Shafer Master Seal double row self-aligning roller bearing pillow blocks. The all-welded steel boot section is totally enclosed, dust-tight and moisture-proof.

● Two-Way Block Process

The Mishco Corporation of Miami, Florida, in cooperation with the Mortarless Tile Machine Company of Los Angeles, Calif., has made available to the concrete block industry a process for manufacturing both the conventional type of block and the mortarless block, using only one machine and one set of pallets. A newly designed and patented reversible pallet developed by the Mortarless Machine Corporation allows the block manufacturer to produce conventional block with one side and mortarless blocks with the reverse side.

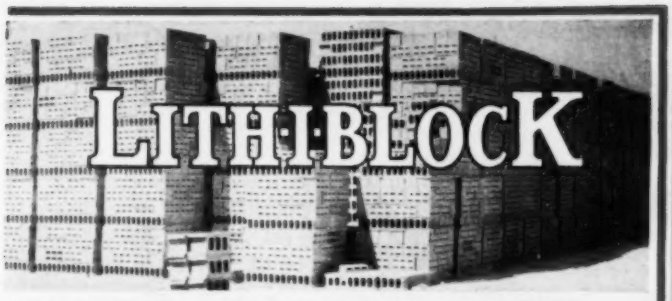
IN THE CONCRETE PRODUCTS INDUSTRY
Lith-I-Block IS THE MACHINE THAT
FITS THE AGE

In its modernization strides, the concrete products industry has learned to its great profit that the machine which best fits the age is the surest means to lower costs, lower overhead, lower maintenance — and better price, for a better product. The Lith-I-Block production machine is expressly made for those who want the highest type of fast, streamlined output — with the fewest motions, the least amount of labor, the lowest power demand and none of the excessive dead weight of a bygone age.

Two- and Three-Block Models

A complete cycle every 15 seconds — delivering 480 or 720 perfect 8 x 8 x 16s per hour on plain pallets — with just the push of a button. Lith-I-Block makes full use of the vibrating principle — goes all the way, without any need of applying pressure. It's the machine you'll eventually come to — so why not now!

Write for descriptive literature and names of nearby users.
LITH-I-BAR COMPANY
Dept. CM 11 HOLLAND, MICHIGAN



IN THE BUILDING FIELD

***The* CONCRETE MASONRY UNIT THAT BEST**

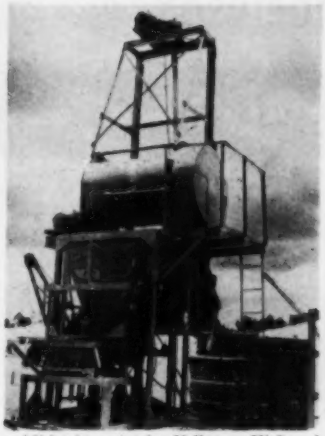
FITS THE TIMES

After all, the only reason you have a block machine is to be in the business of *making blocks that sell.* If you want a building block that has more than a cellar future, more than a cheap market — then investigate Lith-I-Block! Lith-I-Block producers do not operate to a limited demand or a restricted market — they have the concrete masonry unit that best *fits the times* — one that is ideally made with the quality running true all the way thru —the kind of accuracy and uniformity and precision that gets it above the ground into the superstructures where the big volume is to be obtained — and where prestige is made for the Lith-I-Block producer. Why not ride the Lith-I-Block tide — it means more business coming your way! You'll get better quality blocks — and more to each sack of cement! Write for the convincing proof on Lith-I-Block superiority — and get in now while the getting is good.

LITH-I-BAR COMPANY

Dept. CM 11B HOLLAND, MICHIGAN

All Shapes and Sizes to Fit All Purposes
Adaptable to All Aggregates



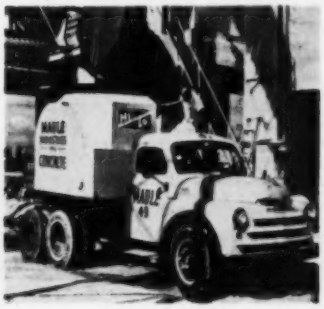
Mishco's Appley-Yellen Hi-Speed block machine, using the type "R" reversible pallet, can produce either block with only minor adjustments to the core box. Thus, with only one core box and one set of pallets, either type of block can be manufactured, reportedly without sacrifice of quantity production, at low equipment cost and maintain the close units of dimensions demanded.

● Truck Mixer

Although the "Hi-Lo" truck mixer is ruggedly constructed, it is light in weight and fast to charge, with controlled discharge fast or slow as desired. The Hi-Lo Jr. truck mixer normally can carry up to 3 cu. yds. of concrete, installed on a single-axle truck, and not exceed the single-axle weight limitation of 18,000 lbs. which prevails in many states. These devices are made by the Concrete Transport Mixer Co., 4980 Fyler Ave., St. Louis 9, Mo.

Featuring "visible mixing action", the open-top, stationary drum mixer with its revolving blade produces a kneading, folding, and blading which reportedly provides a homogeneous mix and prevents segregation, assuring uniform consistancy from batch to batch. The rugged four-way plate combination cat walks and fenders are standard equipment. Hi-Lo Jr. and the larger Hi-Lo truck mixers can be installed on any truck chassis.

All Hi-Lo models comply with Truck Mixer Manufacturers Bureau standards and carry rating plates by the National Ready Mixed Concrete Association.



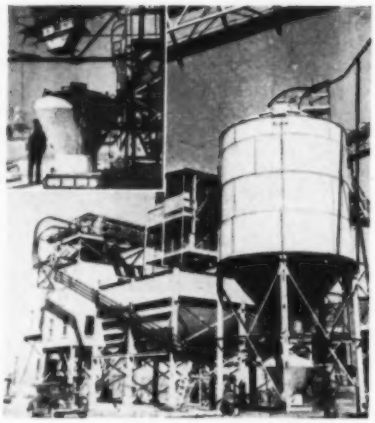
ROBINSON *Air-Activated* CONVEYOR

• Avoid Bag Costs —

Buy Bulk Cement

• Avoid High Bulk Handling Costs —

Use the Robinson System



YOU know of the change in conditions under which cement is now shipped. Cloth bags are out. Paper bags have to be paid for and disposed of. Bagged cement must be handled manually. All of this adds up to as much as 10c per bag which can be eliminated. Doesn't this point directly to the advantages of (1) buying cement in bulk and (2) handling this bulk cement pneumatically? This method will result in substantial savings over handling cement in bags.

Here's what the Robinson System has to offer: (a) proved lowest cost operation with moisture-free air and (b) no motor-driven parts in connection with the handling of the cement. Maintenance is negligible.

Our engineers will be glad to help work out a plan for you to receive cement in bulk and convey it the Robinson way from siding to storage to mixing plant. Many dam contractors, who sure have to watch their costs, and many concrete mixing plants are now Robinson-equipped.

ROBINSON *Air-Activated* **CONVEYOR SYSTEMS**

Division of MORSE BOULGER DESTRUCTOR CO.

Representatives in Principal Cities

211-G EAST 42nd STREET • NEW YORK 17, N. Y.

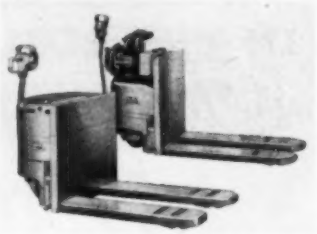
Represented in England by Blow-Knox, Ltd., London

Represented in the French Union and Benelux by Cie Francaise Blow-Knox, Paris

• Hand Trucks

Hand trucks in two power types but of one basic design have been added to the expanding line of modern materials-handling machines produced by the Clark Equipment Company, Battle Creek, Mich.

One of the new trucks, the "Electro-Lift," is battery-powered, with motor drive; the other, the "Hydro-Lift," is gasoline engine-powered, with hydraulic pump and motor drive. Each model, it is said, possesses certain definite advantages for particular handling operations.



Noteworthy features emphasized in the announcement of the new trucks include compact design, providing what is said to be the shortest turning radius and shortest wheelbase of any truck of this type; high maneuverability, facilitating operation in narrow aisles, vehicle bodies, and close quarters; motor mounted in the drive wheel in both power types; power reserve for peak loads on ramps in both power types; accessibility for ease of maintenance, said to be greater than in any other machine of its type; vital parts easy to get at, all lubrication points on the outside; ample underclearance to prevent "hanging up"; gradability; reduced wear on rubber and floors because of large (14-in.) drive tire; one rugged frame for both models, built for long life; compact drive unit, fully enclosed; large, mechanical self-energizing brakes.

The battery-powered Electro-Lift is driven by a new GE compound motor which develops 1¼ hp. Automatic acceleration is provided to prevent overloading of driving motor and dumping of loads. The motor is mounted inside the 14-in. drive wheel; and the output shaft drives through a triple reduction of 32 to 1 into an internal gear attached to the wheel.

In the compact hydraulic lift system the pump motor, pump, reservoir, relief valve, and control valve are designed in one unit, with a single line running to the lift cylinders.

The Hydro-Life is powered by gasoline engine driving a hydraulic pump and motor. The hydraulic motor is mounted in the same manner as the electric motor—in the 14-in. drive wheel, with the output shaft driving through a reduction to an internal gear in the wheel.

The Hydro-Lift engine is a 2-cylinder opposed type, air cooled, and rated at 5.5 b.hp. at the governed speed of 2800 r.p.m. A mechanical governor and fuel pump are standard equipment.

● Concrete Finishing Material

The Irvington Form & Tank Corporation, 20 Vesey Street, New York 7, N. Y., is now offering a concrete finishing material called "Speed Finish."

Used in place of the usual rubbing method of finishing concrete, it eliminates the costly features of the rubbing method and reportedly does not destroy any properties of the concrete. According to the manufacturer, Speed Finish develops a mechanical and chemical bond with the original concrete which improves the appearance and durability of the surface and acts as a protection against abrasion and spalling.

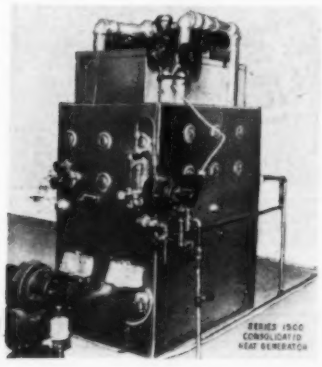
● Block Plant Boiler

After a long period of testing in the Consolidated Research Laboratory and in concrete products plants throughout the East, the Consolidated Boiler Corporation, 126 Dartmouth St., Boston 16, Mass., has built for the concrete products industry the "Consolidated Heat Generator", a curing unit for curing blocks.

The Consolidated Heat Generator is a low-pressure boiler designed to take over the operation of high- and low-pressure boilers, meeting the concrete products industry's requirement of being able to furnish saturated, medium saturated, and a superheated dry steam, with all three types furnished at the same time or separately and within a few minutes from a cold start. The unit reportedly performs its work rapidly and economically.

The curing method is to start with a highly saturated steam, which allows units initially to absorb the proper amount of moisture. This operation is continued for a short period. Then, by throwing a snap switch, the moisture content of the steam is reduced and the temperature is increased, to fill the curing room with comparatively moisture-free, high-temperature steam. This steam dries the unit from the inside out.

The Consolidated Heat Generator has a patented construction, with vertical flues and special baffles to hold the heat within the boiler, and guaranteeing a recovery of from 85 to 95 percent at all times. The unit is completely automatic and requires no licensed engineer; it has been said to cut the cost of fuel as much as 50 percent.



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FASTER—in every function
LOWER COST—to buy, maintain

Engineered, not stripped, for lighter weight. No change in heavy gauge of drums and blades. Many advanced features. Send for Bulletin TMH-10.

THE JAEGER MACHINE CO.
602 Dublin Avenue,
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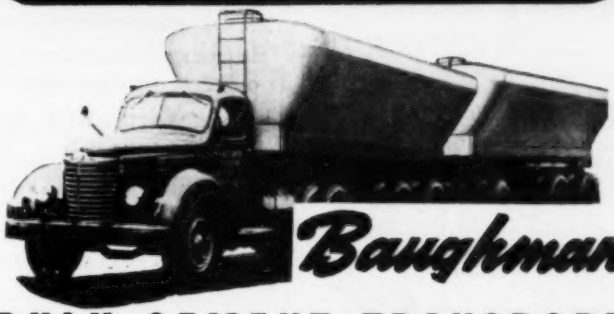
2, 3, 4½, 5½ cu. yd. sizes. End-loading or sealed drum top-loading types.

Fluid drive, if you want it.

"Low Charge" truck mixers in sizes up to 10 cu. yds.

FLUID DRIVE
(if you want it)

Greater Payload... Lower Equipment Cost



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BULK CEMENT TRANSPORT

Meets your capacity and load requirements without the cost of special equipment. STANDARD sizes . . . 15 to 33 feet long. Ruggedly built of high tensile alloy steel for more strength with dead weight cut to the minimum. Can be made self-supporting. Waterproof roof . . . manholes evenly spaced for capacity loading.

Self-Unloading **— twin screws give fast action. Special air cells assure easy starting and high speed discharge. Equipped with powerful motor . . . all controls conveniently located on outside of body.**

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...on the purse!

EASY
...to operate!

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ADDING MACHINE

Smith-Corona brings you quality and advantages of machines costing far more. Add to all standard features these Smith-Corona extras: Exclusive *Colorspeed Keyboard*, to protect you from error, quicken work. *Error Control* to correct individual column mistakes before adding. "Clear Signal" to keep you from including unwanted figures. *Trouble-free* operation. Instant ejection and replacement of tape. You'll agree, Smith-Corona gives you more than you expect for the price you pay.

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A complete cash register plus adding machine services at lowest cost.

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Gentlemen: Please send detailed literature on
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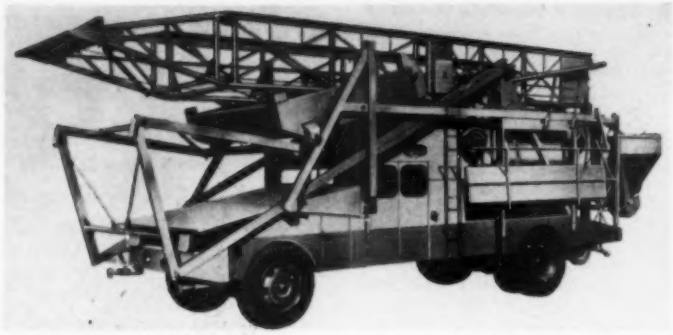
Address
City Zone State



● Two-Cu. Yd. Mobile Mixer

A new and improved model of the 2-cu. yd. "Mixermobile" M-7 is announced by Mixermobile Manufacturers of Portland, Ore. The 2-cu. yd. Mixermobile was the first machine made by the company, and the new model employs technical developments tested and proved since the first model was made.

More streamlined and efficient, the Model M-7 is a complete mobile concrete mixing and elevating plant. It has a hydraulically operated self-loading skip for receiving batched aggregates directly from dump trucks, portable batching plants, or front-end loaders. The unit has a standard 34-ft. steel tower, with 10-ft. extensions available. From the mixing drum, the mixture is transferred by a dumping spoon into the elevating bucket, then hoisted and poured into the storage hopper. Power is furnished by the truck motor, an 8-cylinder Chrysler heavy-duty Industrial engine. The M-7 Mixermobile can be used with ready-mix.

The new model has many important new features, including hydraulic hoisting controls. When the drum is revolving, the mixture can be inspected through either front or rear openings of the drum.

An improved electronic water meter which can be set and locked measures amounts of water from zero to 100 gallons automatically and without variation. Another new feature is in power take off, performed by a power-divider which transmits the power for skip mix-

Hi-Lo TRUCK MIXER

Meeting Load Limitations with high capacity

...at a NEW LOW COST

- **Rugged Construction**
- **Light weight & Speed**

The HI-LO and HI-LO Jr. TRUCK MIXERS embody the Revolving Blade Mixing (kneading, folding, blading) — and VISIBLE MIXING ACTION so popular for the past 20 years.

You See ALL THE ACTION

HI-LO Jr.

For Speed — Flexibility and Low Cost, look to . . . HI-LO TRUCK MIXERS.

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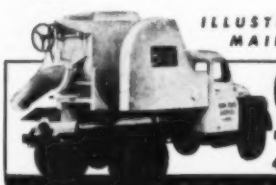


CONCRETE TRANSPORT MIXER CO.
Phone Flanders 7800
4989 FYLER AVE. • ST. LOUIS 9, MO.
Serving the CONCRETE INDUSTRY 20 YEARS

ing and hoisting operation transmission. Planetary drive hoist clutches are provided for skip and bucket hoist, direct drive for mixing drum, water pump, and hydraulic oil pump. Direct drive for highway travel provides speeds up to 40 m.p.h.

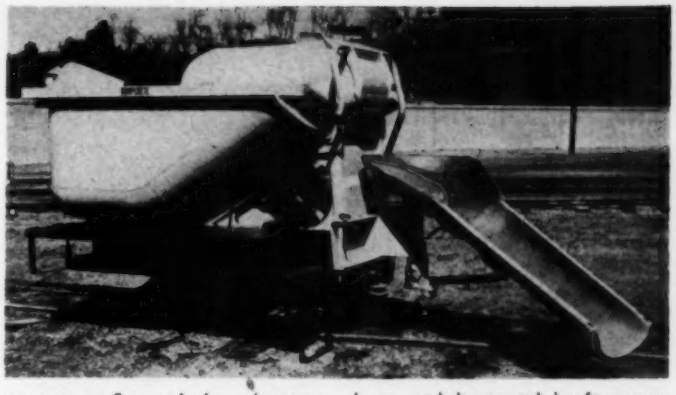
As in the previous model, the operator of the M-7 Mixermobile stands on the cat-walk, controlling the various operations.

Folded for traveling, the 2-cu. yd. Mixermobile is 33 ft. long and 12 ft. high. It weighs 24,000 lbs. It passes within highway limitations anywhere in the United States and complies with the standard truck highway speeds. It is claimed that an experienced operator can set up or take down the new Mixermobile in ten minutes.

● New Dump Body Features

Designed for fast delivery and placement of pre-mixed concrete, the "Dumpcrete" body has been improved to permit greater production and ease of operation. In making these changes, user suggestions have been studied, tested, and in a number of cases adopted. The swinging baffle inside the body has been increased in overall height and relocated to improve the discharge action of the concrete. Gate wings are built higher with longer slope than previously, to permit an even faster, easier unloading of the concrete.

The sides of the hopper section of the chute have been increased to eliminate concrete overflow and the swing-away type chute has been added to the 4-cu. yd. body, making this feature standard on all three sizes. For driver convenience, strap steps are provided on front and rear running boards, and gate discharge handles are more easily accessible. The fenders have been increased to cover dual rear tires. Dumpcrete Division, Maxon Construction Company, Inc., 131 North Ludlow Street, Dayton 2, O.



● Expansion Joint

Fiberglas expansion joint, a new product for use in concrete work, has been announced by Owens-Corning Fiberglas Corporation.

An asphalt-impregnated, bonded glass wool board, faced on both sides with a heavy, asphalt-saturated kraft paper, Fiberglas expansion joint is designed for use in concrete highways, canals, sidewalks, airport runways, bridges, factory floors and wherever concrete pavements are used in large areas.

Fiberglas expansion joint prevents foreign matter from entering the joint and rendering it ineffectual for opening and closing to relieve thermal or upheaval stresses.

The new product will be sold through Fiberglas branch sales offices located in 52 principal cities in cooperation with the Keystone Asphalt Products Company, 43 East Ohio Street, Chicago, Ill., appointed national distributors for Fiberglas expansion joint.

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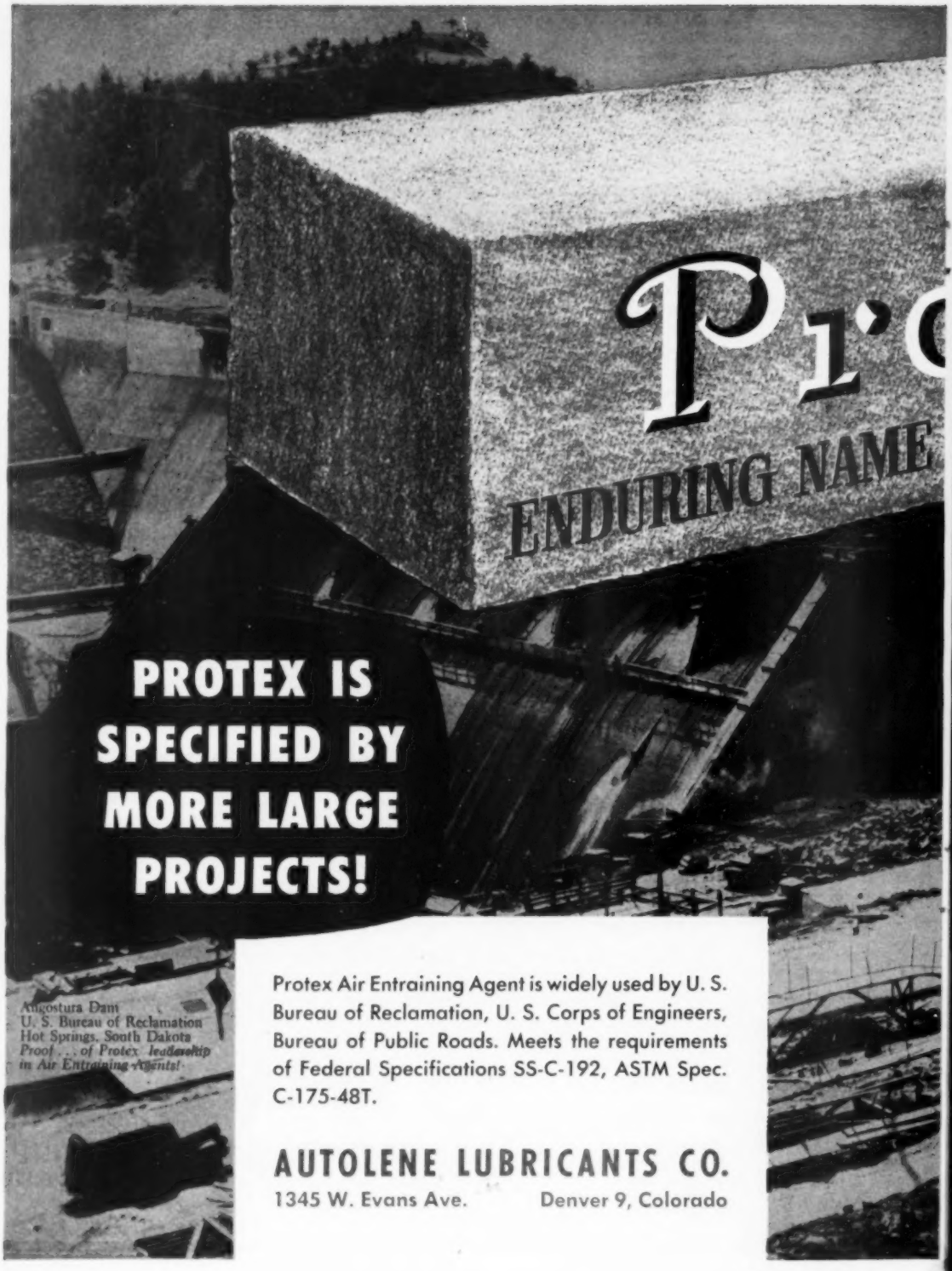

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U. S. Bureau of Reclamation
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Protex Air Entraining Agent is widely used by U. S. Bureau of Reclamation, U. S. Corps of Engineers, Bureau of Public Roads. Meets the requirements of Federal Specifications SS-C-192, ASTM Spec. C-175-48T.

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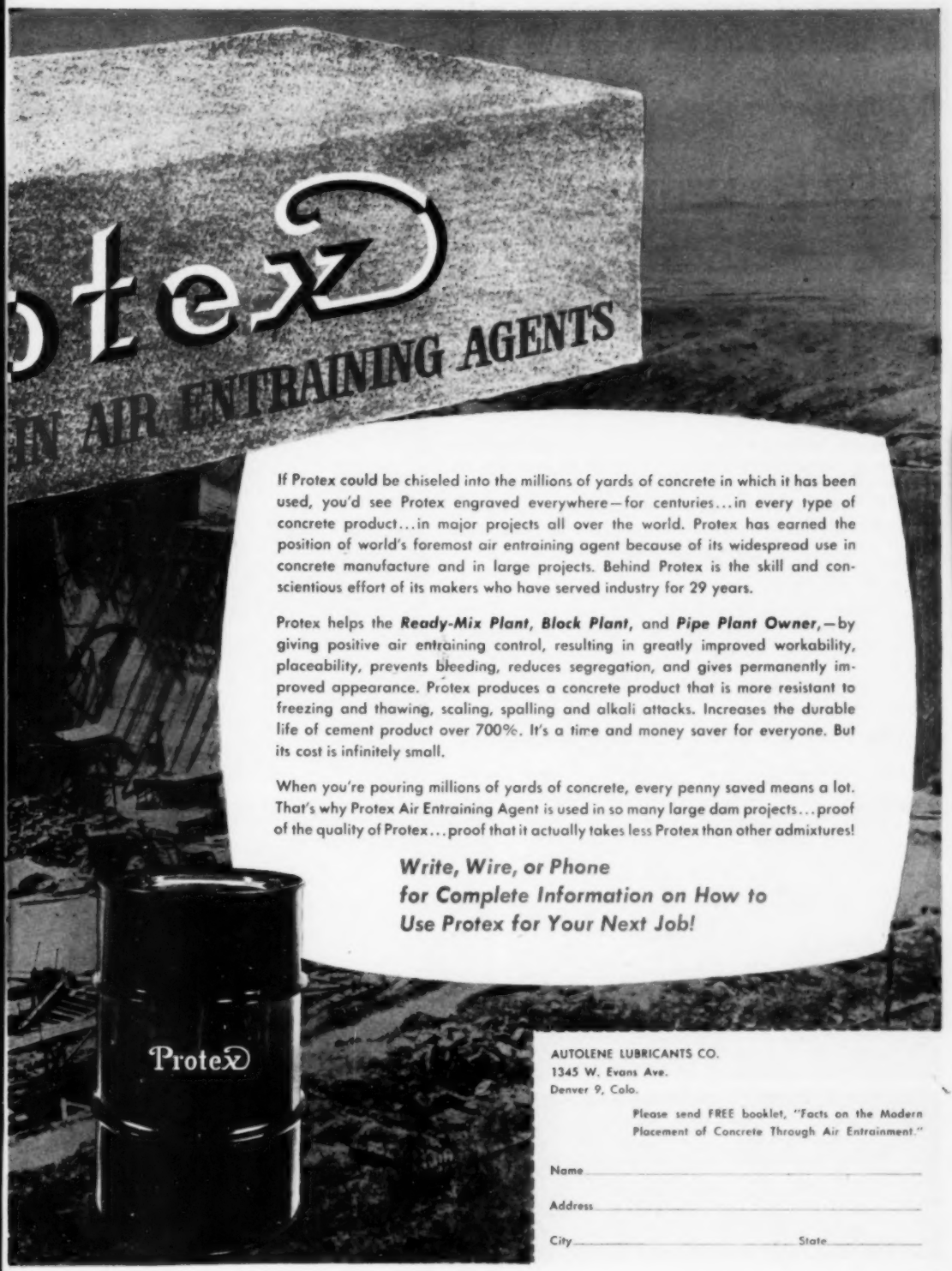

If Protex could be chiseled into the millions of yards of concrete in which it has been used, you'd see Protex engraved everywhere—for centuries...in every type of concrete product...in major projects all over the world. Protex has earned the position of world's foremost air entraining agent because of its widespread use in concrete manufacture and in large projects. Behind Protex is the skill and conscientious effort of its makers who have served industry for 29 years.

Protex helps the ***Ready-Mix Plant***, ***Block Plant***, and ***Pipe Plant Owner***,—by giving positive air entraining control, resulting in greatly improved workability, placeability, prevents bleeding, reduces segregation, and gives permanently improved appearance. Protex produces a concrete product that is more resistant to freezing and thawing, scaling, spalling and alkali attacks. Increases the durable life of cement product over 700%. It's a time and money saver for everyone. But its cost is infinitely small.

When you're pouring millions of yards of concrete, every penny saved means a lot. That's why Protex Air Entraining Agent is used in so many large dam projects...proof of the quality of Protex...proof that it actually takes less Protex than other admixtures!

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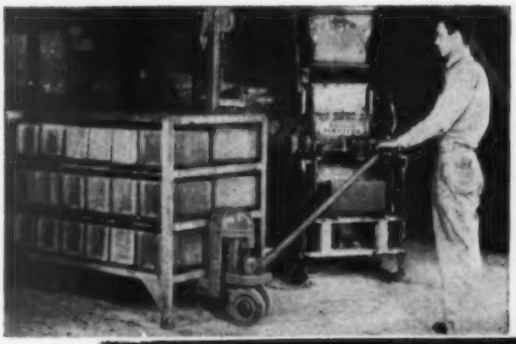
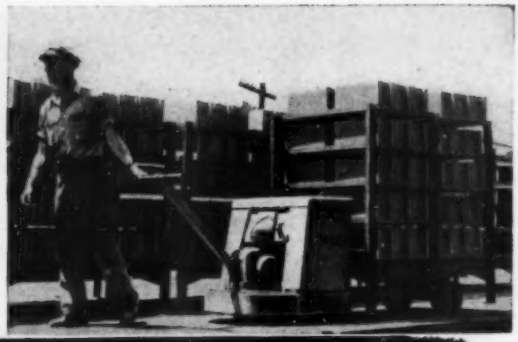
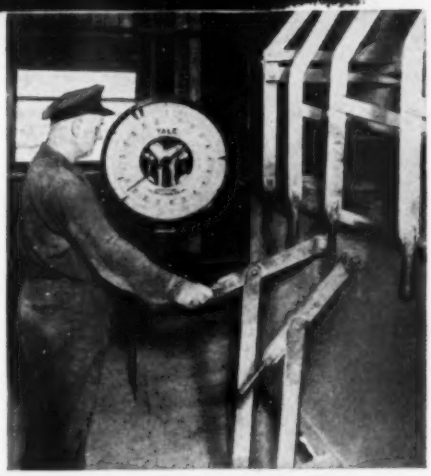




Cut Costs so they stay cut!



You can't do much, if anything, to cut the cost of the materials that go into your concrete products. BUT you can do a lot to reduce the cost of production and handling.

For instance, you can control quality and minimize the reject problem through accurate batching with Yale Scales. And, when it comes to handling your products quickly and safely in volume, you can depend on Yale Trucks and Hoists to "deliver the goods" with far less chance of chippage and breakage.

Wherever Yale Material Handling Machinery goes into service, the gap between costs and profits widens—permanently. To help you visualize what economies can be effected in *your* plant, call in our nearby representative. He will gladly match his time with yours to prove that Yale equipment is the best investment you can make.

THE YALE & TOWNE MANUFACTURING CO.
Department L-159
Roosevelt Boulevard Philadelphia 15, Pa.

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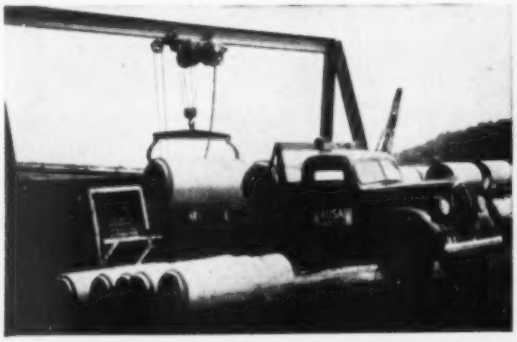

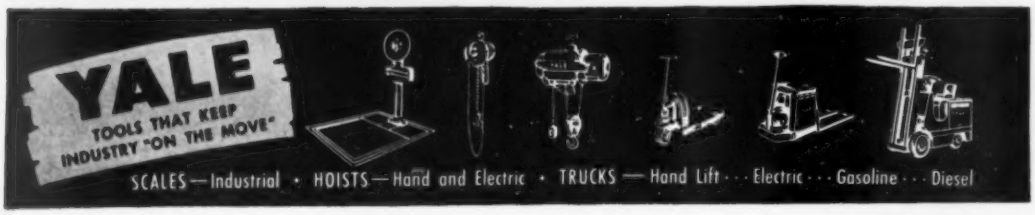
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READY-MIX Comes to Chicago!

"King" Size 6 Yd. Smith Tilters and Smith-Mobile Truck Mixers and Agitators Lead the Parade

Ready Mixed Concrete is relatively new in Chicago. But as this big city turns from local job mixing to Ready Mixed Concrete, you find Smith Tilting Pre-Mixers and Smith-Mobile Truck Mixers and Agitators leading the parade as usual.

Smith equipment was NOT selected on the basis of price and delivery. Instead, operators chose it on the basis of quality and proven performance in Chicago, as well as all over the world. The biggest plants in Chicago are using this winning combination . . . Smith Tilting Pre-Mixers and Smith-Mobile Truck Mixers and Agitators. So are many of the other operators in the greater Chicago area.

The fast growing demand for concrete in and around Chicago has created a PEAK requirement. Smith Tilters and Smith-Mobiles are filling the bill. They are doing a rugged job, with a minimum of lost time and maintenance cost. Get the complete story. Ask for bulletins Nos. 239A and 244.

THE T. L. SMITH COMPANY

2887 N. 32nd STREET • MILWAUKEE 45, WIS., U. S. A.

For BETTER and BIGGER Concrete Mixers and Truck Mixers Look to

SMITH

Material Service Corp. plant at 901 N. Sangaman Street, Chicago, Ill. Smith 6-yard Tilters and Smith-Mobile 7½ and 8⅜ yard Agitators form a winning combination.

Consumers Company new plant at 5541 West Grand Ave., Chicago. Smith 6-yard Tilters and Smith-Mobile 6⅛-yard Agitators. ONE BATCH PER TRUCK. No waiting.

SMITH MIXERS

FOR BIG CONCRETE PROJECTS AND READY-MIX PLANTS

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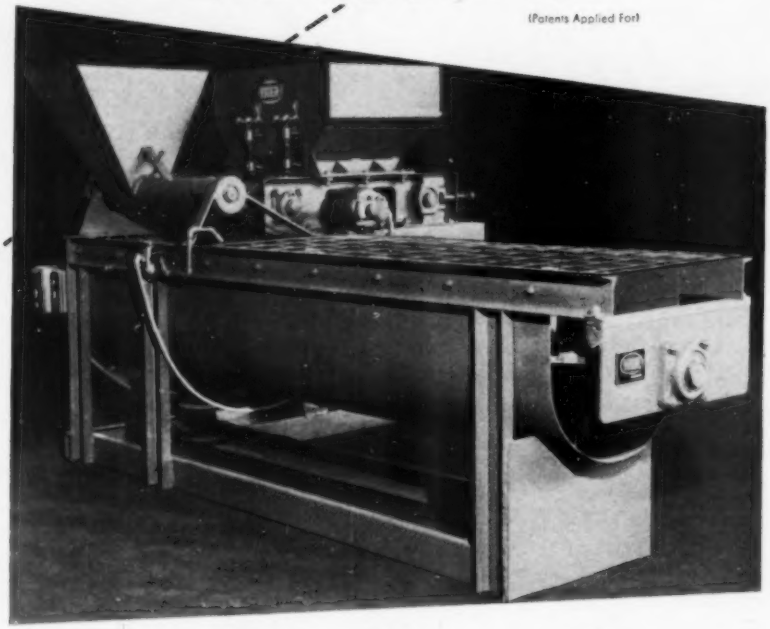
YODER CONTINUOUS MIXER

with Vibrating Constant Volume, Non-clogging Belt Feed

(Patents Applied For)



proves Big Money-Saver

Makes 50% Higher Strength Concrete than 5-Minute Batch Mixes in Same Plant

That, in brief, was the result reported by the City of Detroit Testing Laboratory on 12 units made at the plant of the Berger Cement Block Co., Detroit. Half of the units were made from concrete mixed in the Yoder, the other half in a conventional Batch Mixer. (5-Minute mix). The Yoder also showed more *uniform* strength of units. If these facts mean anything, they mean *more economical mixes can safely be used to obtain a given strength.*

You save four ways when you install this Yoder Continuous Mixer: First, the initial cost is much lower — as much as one-half. Secondly, you save all the expensive equipment back of the block machine, including weight batchers. Third, maintenance cost is cut in half or better. Fourth, more economical mixes can safely be used.

Get the facts! Send for literature, including full report on tests at the Berger Plant.

Concrete Machinery Division

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Your most profitable VISITOR

Well known and warmly welcomed by the Ready Mixed Concrete world is the BUTLER Engineer. For more than a generation BUTLER Engineered Design has advanced the concrete industry from a technical and a profit standpoint. Ready Mixed Concrete Plants over all of the North American Continent are visible evidence of the soundness and ingenuity of BUTLER planning . . . So, in the solution of your Ready Mixed Concrete production problems—call in the BUTLER Engineer.

For typical examples of BUTLER Ready Mixed Concrete Plants, profusely illustrated with photographs and detailed plans, write for Bulletin 185.

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987 BLACKSTONE AVE. WAUKESHA, WISCONSIN

PALLETS WANTED

(All Kinds)

WE WILL BUY YOUR CORED AND PLAIN PALLETS AND PAY YOU "TOP" CASH PRICE IF THEY ARE CLEAN AND IN PERFECT SHAPE.

WE GIVE ALL MAKES OF BLOCK MACHINES AWAY "FREE" TO ANYBODY AGREEING TO BUY THE PALLETS.

KINDLY KEEP IN MIND THAT WE GUARANTEE EVERYTHING THAT WE SELL, AND YOUR PALLETS MUST BE GOOD OR WE DO NOT WANT THEM.

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War Surplus Bargain

New — Ready To Use!

40,000 BTU capacity

—Burning gasoline, kerosene or diesel fuel.

—Electric blower—12 V. DC or 110 V. AC using small transformer which we furnish with each heater.

Portable, Quick, Clean Heat

Ideal for curing room, concrete plants, work under construction, emergency heat, or auxiliary heaters.

$95.00 each

Clapp, Riley and Hall Co.
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Complete Plant Equipment

Stearns Model A Clipper Stripper
12 Cu. Ft. Stearns Mixer with 7½ H.P. Motor
Model 752 Vi-Brik-Crete Brick Machine
14 Ft. Concrete Conveyor with Motor
Barrett-Cravens Hand-Hydraulic Lift Truck
1280 Pallets for Clipper Stripper
500 Pallets for Vi-Brik-Crete
Inventory of replacement parts for all equip.
30 Curing racks and shelf members.
This equipment is all in first class condition, our reason for selling is that we have installed a complete new automatic plain pallet plant.

RUSSELL CONCRETE PRODUCTS CO.
P. O. Box 81 **Phone 813-J**
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FOR SALE

FLEMING VIBRATOR block machine complete with motor, operating switches, three mold boxes (4"-6"-8") and attachments. — Like new.

WOODEN PALLETS—1300—2" x 9½" x 17".

CHAMPION DRAIN TILE MACHINE complete with 4-5-6 and 8" attachments.

Will sell at a very reasonable price.

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NEW AND USED EQUIPMENT FOR SALE

15—Block Machines—All Makes and Capacities
7—Batch Mixers—All Makes and Capacities
4—Platform Lift Trucks
1—Block Plant Fork Truck
1—P.C.A. Joist Machine—26 Ft. 8" and 12"
17—New and Used Brick Machines

Many Miscellaneous Items of Block Plant Equip. Write for detailed list of all items and arrange to see the items of your interest.

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AGGREGATES FOR SALE

Lightweight fire safe 50 to 70 lbs. per cu. ft.
Cinders Kiln made
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High carbon shale for cement, Brick or Centering plants
Also heavy aggregates 150 to 200 lbs. per cu. ft.
All aggregates processed ready to use.

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FOR SALE

Because we are unable to use this practically new equipment we are offering our George Super V Block Machine free to anyone who will buy the rest of the equipment making up the complete plant including individual electric motors and wiring. This machinery must be sold immediately to make room for other equipment. This is a list of the equipment that goes with the machine:

1 Hopper
1 12" and 4" attachment
1 One-bag mixer
1 Conveyor
1 Split core
500 Pallets 12"
500 Pallets 4"
1500 Pallets 8" Corner & Jamb
1 Truckman Model D
1 Crusher, complete with accessories
1 Motor for crusher 7½ HP 1250 RPM
1 Pallet oiler
35 2" by 2" by ¼" Angle Iron Curing Racks

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UNBREAKABLE PALLET RINGS
Write for full information
TEXAS FOUNDRIES
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FOR SALE

10 20' and 10' dumperete bodies complete with rams, pumps, and valves. Excellent condition, priced from $500.00 to $1200.00 or less than half of original cost.

IMPERIAL READY MIX CONCRETE COMPANY
3400 W. Lake Street **Melrose Park, Illinois**

PRICED TO SELL

Complete block plant equipment including two—8" block machines, 3 motors, conveyor, mixer, & over 1,000 pallets.
One block machine brand new, other slightly used.

$3,000 for quick sale — (Worth more than $6,000)

Harvey Nott **Manchester, Maryland**

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All shades and grades the highest quality.
Write for color cards, prices and samples
RICKETSON MINERAL COLOR WORKS
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Established 1885

WANTED: CORED PALLETS

3000	Zonal	500	Pansy
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2500	Bobbin		

Quote us your cheapest selling price and forward samples to:

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Sixth and Iron Streets, Lansdale, Pa.

CEMENT COLORS

Write for free samples and prices of "LANSCO" CEMENT COLORS produced in 34 attractive shades. Packed in bulk and in 1 lb. and 5 lb. packages.

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LANDERS-SEGAL COLOR CO.
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4 — Stearn's Clipper

Stripper Block Machines, $300.00 to $750.00 each. Pallets, racks, mixers, Conveyors, hoppers.

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1—Perma-Tile Semi-automatic concrete tile roofing machine—never used—with 1700 used pallets
1—20 ft. belt conveyor
1—11 cu. ft. multiplex mixer
1—3 H.P. Automatic boiler

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Dumperete (1947)—in excellent shape mounted on International C 40 Truck. First $1150.00 takes complete outfit. Also, Vi-Brik-Crete Machine (Brick-maker) purchased new in 1948; will sell for $225.00.

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BLOCK MACHINES AND PALLETS

1—Kent tamp block machine
1—E. B. Kelley Power Stripper with air lift
2000 Pressed steel pallets 8 x 8 x 16
500 Cast iron pallets 8 x 10 x 16
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Everything needed to produce highest quality concrete pipe . . . mixer, conveyor, machine, jackets, plates and parts, right down to the off-bearing cart . . . all from *one* manufacturer whose modern facilities and long experience assure completely satisfactory service from all equipment.

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1000—8" Modular pressed steel pallets. Code Cake.

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Complete Kirkham Concrete block plant. Can be seen in operation NOW.
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BRICK MORTAR
STUCCO-PLASTER-CONCRETE
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Both McCracken Type and Martin Trowelers—PROVED to last as long or longer — yet cost considerably less. Write for prices.
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A rapidly growing Ready Mixed Concrete and Block business in the heart of the most prosperous part of the West Coast of Florida.

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Batch bins, cement bin with cement storage bin, Ready Mix trucks, stake trucks, dump trucks, Fork lift truck, warehouses, Besser 3 Block machine, Tunnel Conveyor for stock system.

$150,000.00 will be required.

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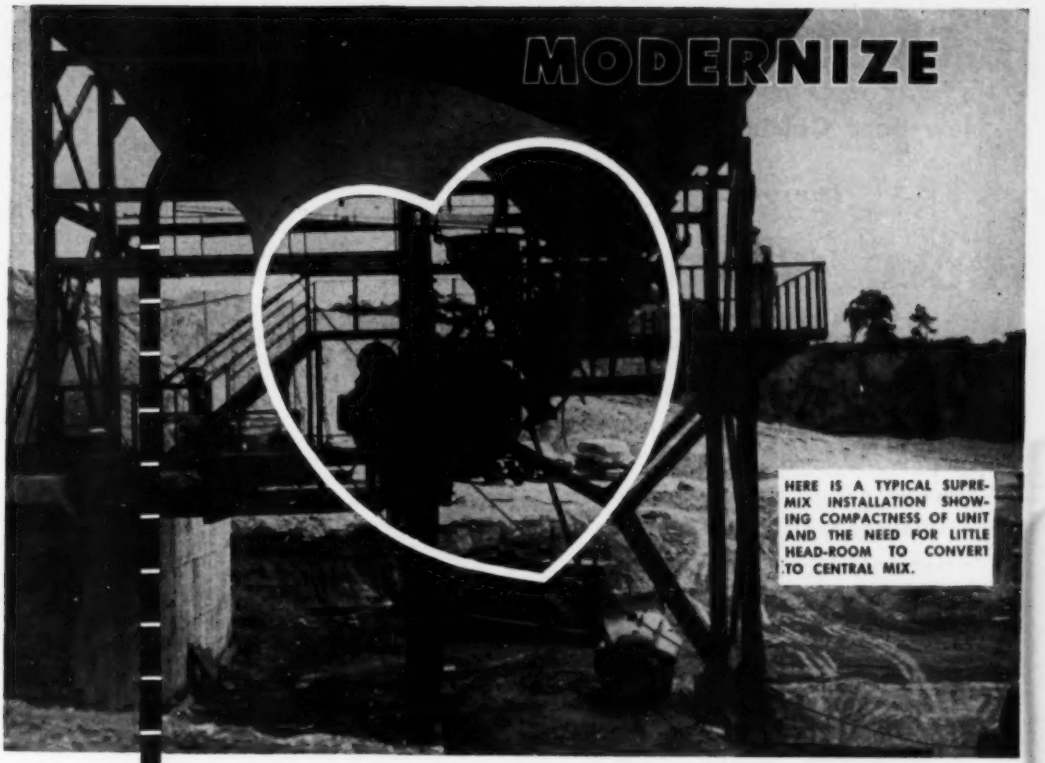
THE CONCRETE MANUFACTURER, 538 South Clark Street, Chicago 5, Ill.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The Modern Low Cost Truck Body for the Delivery of Concrete, Gravel, Sand and Other Materials.

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- Multiple hydraulically operated gates and streamlined batchers conserve time and space.

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Improve

COLD WEATHER CONCRETE?

Do you know exactly what happens to the strength of concrete when the temperature drops from 70° to 40° . . . or to 30°? Do you know the effect Calcium Chloride has on the setting time . . . early strength . . . ultimate strength, during the colder months? Do you know how much—

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√CUTS DELAYS

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- ☐ Bin Level Controls
- ☐ Bins and Batching Equipment
- ☐ Blades, Masonry Saw
- ☐ Block and Brick Machine
- ☐ Boilers
- ☐ Bucket Loaders
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- ☐ Meters, Sand Moisture
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The Marvel Jr. with standard equipment makes 4-inch round drain tile. Attachments can be secured for making 3", 5", and 6" round drain tile and also 4" Hexagon shape drain tile.

We are also the largest manufacturer of SPECIALTY MOLDS for making lawn, garden, porch and other concrete ornamentals.

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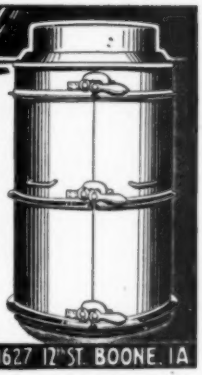

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For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

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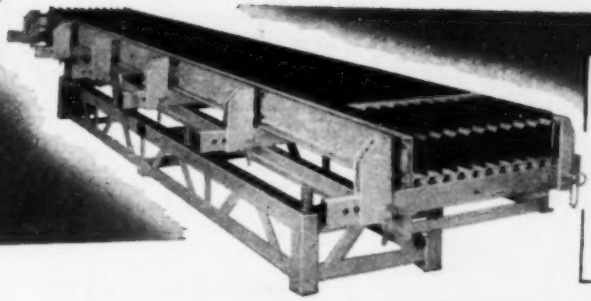

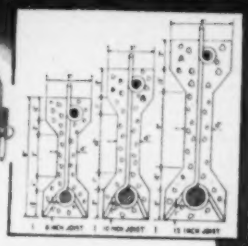

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The addition of the Kirk & Blum Vibrating Table to your present equipment requires a very small initial cost, enables you to make an entirely new line of 8", 10" and 12" joists in 20 and 24 ft. lengths.

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Cash in on the ever-growing demand for steel-reinforced concrete joists. Your experience and contacts in the building trade should make it easy to build up a profitable business in this new line. Concrete joists are simple to make, have unusual strength, are termite proof. The KIRK & BLUM Type "S" Heavy Duty Vibrating Table is capable of multi-production of concrete joists, allowing a fine profit-margin. Easily produced by unskilled operators. For complete details and prices, write to The Kirk & Blum Mfg. Co., 2912 Spring Grove Ave., Cincinnati 25, Ohio.

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Concrete lintels are being more and more widely accepted by builders who formerly would use only steel lintels. That's natural for there are many arguments in favor of the concrete type as made on the KENT LINTELATOR.

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Make lintels 7⅝" HIGH by 3⅝" 5⅝" 7⅝" 9⅝" 11⅝" WIDE in these lengths.

S 6	2'8"	up to	6'
S 7	2'8"	up to	7'4"
S 8	2'8"	up to	8'8"
S 9	2'8"	up to	9'4"
S10	2'8"	up to	10'8"

STANDARD LINTELATORS

Make lintels 7⅝" HIGH by 3⅝" 5⅝" 7⅝" WIDE in these lengths.

No. 6	2'8"	up to	6'
No. 7	2'8"	up to	7'4"
No. 8	2'8"	up to	8'8"
No. 9	2'8"	up to	9'4"
No. 10	2'8"	up to	10'8"

The KENT MACHINE CO.
CUYAHOGA FALLS, OHIO

CONCRETE PRODUCTS MACHINERY SINCE 1925

How a Little Simple Arithmetic Will Save You Money!

A little simple addition will save you money on your cinder aggregates. To the first cost of the unprocessed cinders add all the expenses you incur in making them hopper-ready. Add the cost involved in locating a satisfactory deposit, hauling expenses, interest on your processing equipment investment, equipment maintenance, paper work and all incidental expenses involved . . . to find out what your aggregate costs actually are.

Now **compare** the hopper-ready cost of your aggregates with that of our quality prepared aggregates. In most instances it will be discovered you can obtain our quality product for less.

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CINDERS

Don't overlook the value of a dependable source! Idle equipment and labor make no profits. When you order Miller's cinders you can be sure of a constant supply of hopper-ready aggregates. We have four plants to fill your needs—to keep your plant producing.

Compare the actual cost of your present cinders with that of Miller's hopper-ready aggregates . . . consider the quality . . . consider the value of a dependable source and you will follow the lead of many other successful block manufacturers in ordering quality **prepared** hopper-ready aggregates from Miller's. Contact us today for complete information.

WRITE US NOW — MENTION RAILROAD DELIVERY

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Increase BLOCK Output with a Sturdy *Erickson*

The Platform Truck "Custom-Built" for your racks—from 60 to 108 or more 8x8x16 blocks.

"THE BACKBONE OF BLOCK PRODUCTION" is what users still call the Erickson Platform Truck. Its rugged dependability to handle loaded racks from block machine to kiln assures top speed production with no delays or shut downs. The Erickon platform picks up all racks from the ends and places them close together in the kiln—no wasted space. For faster operation Erickson now offers 4 speeds both forward and reverse.

We will build you a truck exactly suited to your racks and doorways. Also fork-type trucks. Write us—explain your needs.

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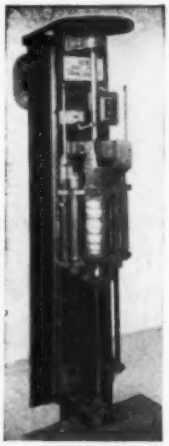
The ACE

An Entirely NEW - Completely DIFFERENT CONCRETE DRAIN TILE MACHINE

EASY TO OPERATE
LOW MAINTENANCE COST
NO GEARS NO CAMS
NO CLUTCH



The ACE is the concrete drain tile machine you have been looking for. Developed after an extensive survey to determine what concrete products men wanted in a drain tile machine, the ACE features a Packer-type combination head and shoes cast in one piece to assure a perfect tile.

GE or Westinghouse 1200 RPM Ball-bearing motor and Stop and Go switch. Finest quality air cylinder, oversize, positive action, precision mounted, heavy-duty construction throughout. Just push the switch, apply the air control valve and the ACE is working for you making a product you'll be proud to sell.

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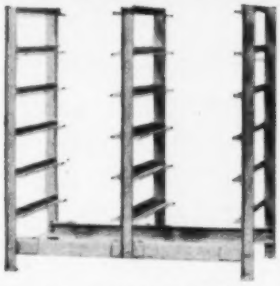
CHASE BLOCK RACKS, CARS, PALLETS

Corrosion-Resistant Hi-Strength Alloy Steel



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Sturdy construction • any style or capacity • Shipped knocked down • Rigid Field connections • assembled Easily

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RUBBER-TREADED!
Wears and grips like a tire

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OUTWEARS 5 TO 10 PAIRS ORDINARY GLOVES

Tough Natural Rubber over palm and thumb. Far outwears costlier leather.

Sure Grip: Rough surfaced rubber firmly grips bags, brick, glass, cement block, sheet metal, lumber — wet or dry.

Strong Fabric Lining and back — comfortable as a canvas glove. Very flexible.

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Double-palm glove, worn out laying 3000 fire bricks.

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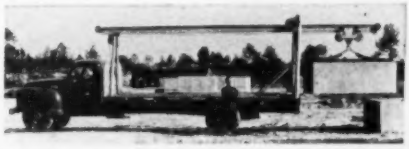
World's largest manufacturers of coated industrial gloves



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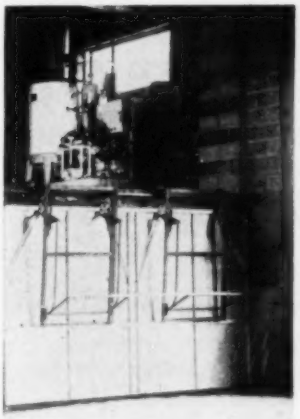
THE MULTICO
"LITTLE BEAVER"

New High Speed, Low Cost Concrete Block Machine

THE MULTIPLEX MACHINERY CORP.
ELMORE, OHIO

All Users Say . . .



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High pressure steam at high temperatures makes for

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State maximum hourly block production and we will forward full data, terms and prices.

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Before Building New Curing Kilns, write for Data and Information on SHORE RADIANT LITEWAYT HYSPEED KILNS

THE *Columbia* MAKES PRECISION BLOCKS.

WRITE TODAY FOR COMPLETE INFORMATION!

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Money-Making Manufacturing Opportunity

Today's tremendous demand for drain tile opens up a choice field for the wide-awake concrete products manufacturer. Either as a business by itself or as a profitable addition to the regular line.

The Champion machine makes all sizes of tile up to 12-inch diameter. With such a range you can supply not only the huge farm market, but many others where drain tile is urgently needed—reclamation projects, home building, road construction, subdivision activities, etc.

Low Cost—High Profits

Tile made on the Champion are outstanding in quality—dense, strong, uniform. Far better than clay tile yet can sell for less—even after allowing a handsome profit. Machine is simple, compact, easy to operate.

Get the facts. Write for interesting literature about the business and the moderate priced equipment.

CONCRETE EQUIPMENT CO.

532 Ottawa Ave. • Holland, Mich.

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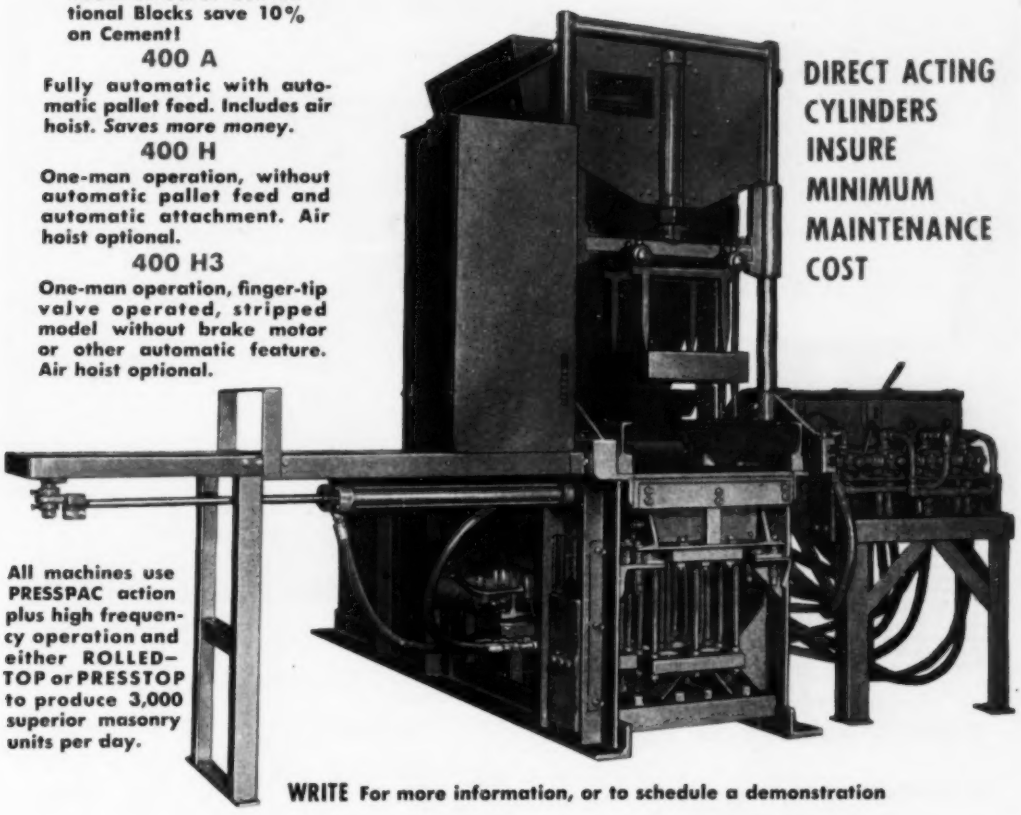

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"Second to none on the market!"

That—from the President of a 33-Year-Old, 50-Employee Company, Now Grossing Three-Quarters of a Million a Year!

Harve E. Kilmer, whose letter, left, so highly praises the two, fully automatic, one-man, Stearns 15 Concrete Block Machines in the Iowa Concrete Block & Material Co., has been with the firm since its start in 1917—general manager, since 1922. With 33 years' experience manufacturing concrete and cinder block, he *ought* to know, and he *does* know concrete block machines from the ground up! He has had a third of a Century to compare and judge them!

IOWA CONCRETE BLOCK & MATERIAL CO.
DES MOINES 8, IOWA

September 18, 1950

Byron Hultmark, President
Stearns Manufacturing Company, Inc.
Adrian, Michigan

Dear Byron:

In June 1947, we installed our first Stearns 15 and two and one-half years later purchased our second one.

As you know, we received one of the first of these new machines and did not get the quality or quantity production we expected. However, thanks to your cooperation, this machine was brought up to date in 1949 and since that time has given excellent service. Our second machine has always been satisfactory in every way.

Although we have produced 8x8x16 blocks on these machines at a rate slightly more than 900 per hour when our aggregate was just right, we find our average production is about 800 blocks per hour per machine. We are able to get high strength blocks with clean, sharp edges and the blocks are always the same height.

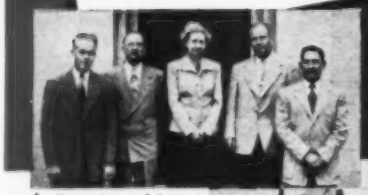
We have received very good service from you and believe your "15" automatic block machine is second to none on the market.

Yours very truly,
IOWA CONCRETE BLOCK & MATERIAL CO.

H. E. Kilmer
President

HEK:tho

Two Stearns 15s in the Des Moines, Iowa, plant of Iowa Concrete Block & Material Co. "800 blocks per hour per machine . . . high strength . . . clean sharp edges . . . always the same height."



▲ Executives of Iowa Concrete Block. Left to right: George Hicks, assistant manager; Harve Kilmer, whose letter appears above, president and general manager; Hilda Carlson, office manager; Roger Stetson, sales manager; Glenn Quivey, assistant sales manager.

▲ Office and buildings of the Des Moines hard-building-materials plant, this year grossing $750,000.

◄ Part of Iowa Concrete Block's yard.

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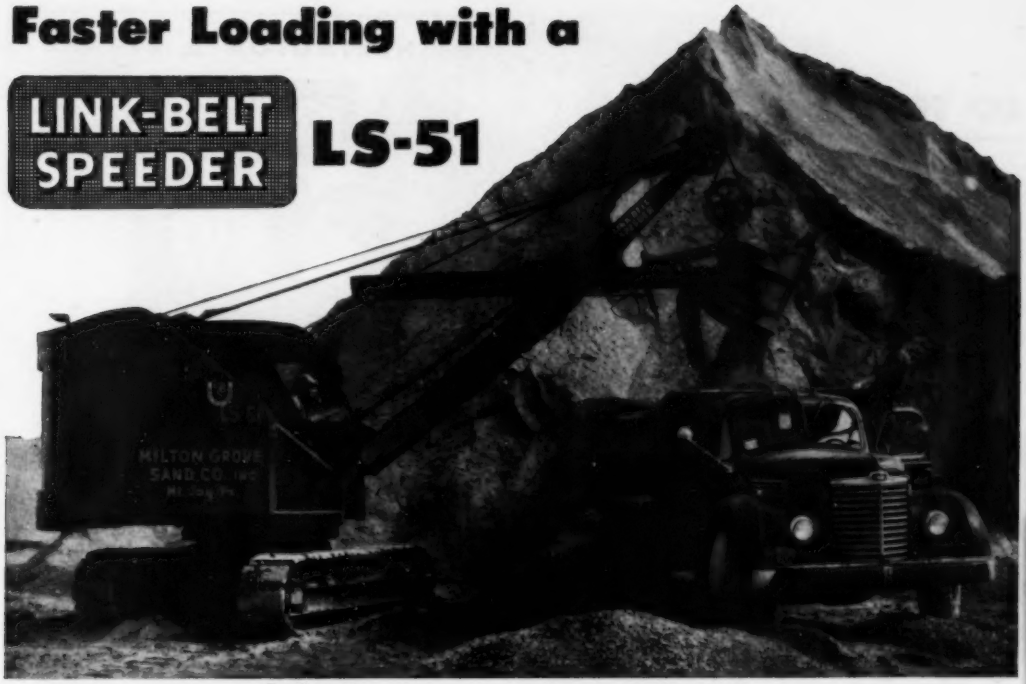

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11,707-A

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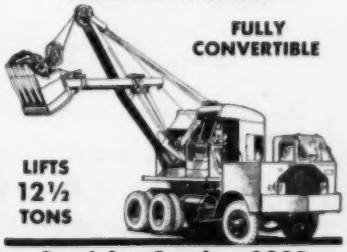

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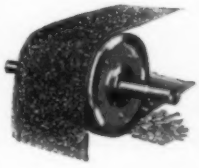

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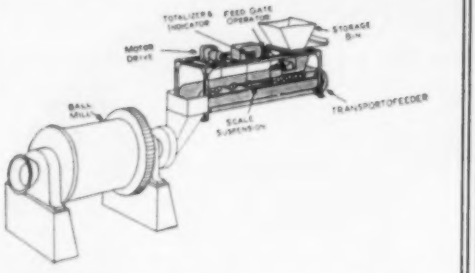

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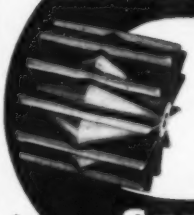

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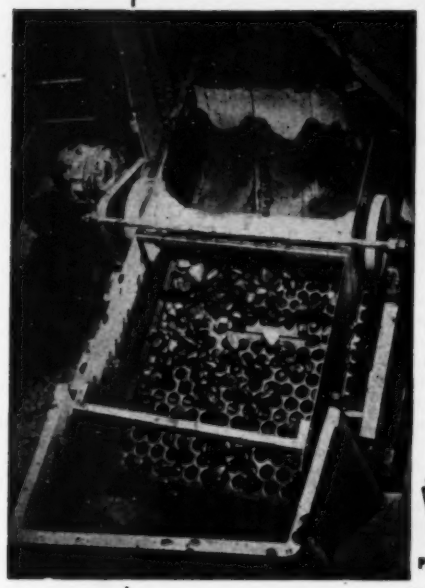

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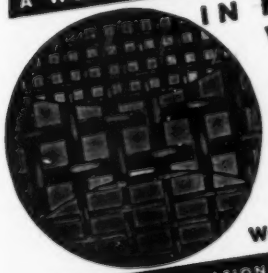

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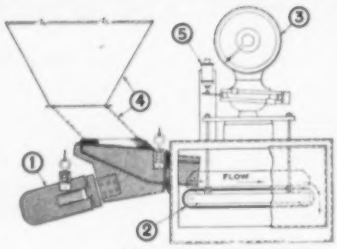

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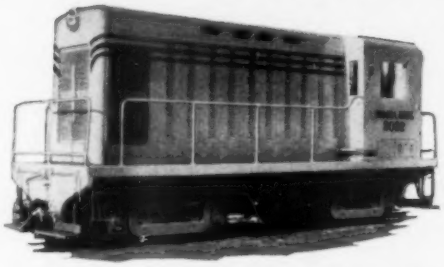

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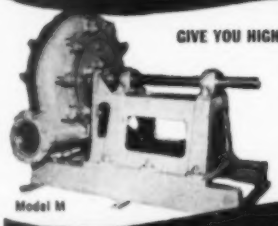

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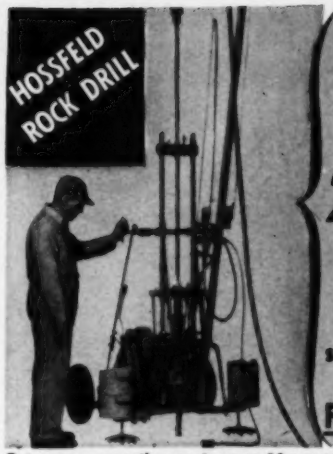

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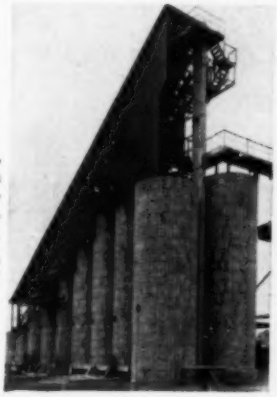

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DO YOU KNOW that the forces of advertising are engaged today in one of the world's greatest jobs of mass education . . . *in the public interest?*

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Write for a copy of Booklet No. 15. It will give you pertinent information about The Advertising Council . . . how it started . . . what it is . . . what it does . . .Or ask for material on specific campaigns. Address: – The Advertising Council, 25 West 45th Street, New York 19, N. Y.

Published in the public interest by

PIT AND QUARRY

*A NON-PROFIT ORGANIZATION FORMED TO UTILIZE ADVERTISING IN THE PUBLIC GOOD

BROADCAST P&Q SECTION

Royal E. Burnham
Attorney at Law

Patent and Trade-Mark Causes

3201 Tennyson Street, N. W.
WASHINGTON 15, D. C.

Quarries
Crushing Plants
Cement Plants
Storage Methods
Operating Costs

E. Lee Heidenreich, Jr.
Consulting Engineer
67 Second St., Newburgh, N. Y.
Phone 1828

Operation
Plant Layout
Design
Construction
Appraisals

POSITION VACANT

Superintendent for Sand and Gravel Plant in the middle west. State age, education, experience, references and salary expected.

Box No. H 2, c/o Pit & Quarry Publications
538 So. Clark St. Chicago 5, Illinois

Diamond Core Drilling
CONTRACTORS

Fireclays, coal, limestone, gravel deposits, all minerals. Blast hole drilling.

MOTT CORE DRILLING CO.
Huntington, West Virginia

CORE DRILLING
ANYWHERE
We look into the earth
PENNSYLVANIA
DRILLING COMPANY
PITTSBURGH 20, PA.

POSITION VACANT

Mechanical Engineer for Cement plant in middle west. State age, education, experience, references and salary expected.

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WANTED

Rock Crushing and Milling Manufacturer requires graduate Engineer for production work. Industrial experience in crushing and milling essential. Mechanical aptitude desirable. Applicant to include all details and salary desired in first letter.

Box No. M 2, c/o Pit and Quarry Publications
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WANTED

Light weight ¾ yard dragline bucket

FOR SALE

Page 1 yd. heavy dragline bucket in excellent condition

No. 5 Austin Gyratory Crusher

No. 32 B Telsmith Reduction Crusher

Any reasonable price accepted.

BICHLER BROTHERS
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Telephone: 1600

WANTED

Bonnot Pulverizer

Screen Type 18″ or 36″

THE GIBSONBURG LIME PRODUCTS COMPANY
Phone 3421 Gibsonburg, Ohio

POSITION VACANT

Chemical Engineer for Cement plant in middle west. State age, education, experience, references and salary expected.

Box No. H 3, c/o Pit & Quarry Publications
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WANT BUY

1—30″ x 36″ or 30″ x 42″ JAW CRUSHER
1—13″ McCULLY GYRATORY
1—3 FT. SYMONS CONE CRUSHER
1—4′ x 12′ DOUBLE DECK SCREEN
2—EUCLID QUARRY TRUCKS

W. H. Friend, M. E.
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WANTED AT ONCE

BROOKS LOAD-LUGGERS

MODELS CH — 150 — 200 and larger

WE PAY BEST PRICES FOR HOISTS & BUCKETS IN GOOD CONDITION

GENERAL TRADERS, INC.
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A mid-western sand and gravel river operation will consider an offer for all or any part of its physical assets, all of which are in good condition. No commission to brokers. For further details write

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WANTED

A complete used Crushing and Screening Plant with 24″ x 36″ crusher—500 to 1,000 ton capacity, or any part of plant.

DAVIS JENKINS II
814 1st Avenue S.W. Moultrie, Ga.

WANTED

50-B electric shovel, Cutler-Hammer controls. Give condition, Serial number, motor and name plate data.

WHITE'S UVALDE MINES
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ACCOUNTANT-COMPTROLLER

CPA, wide experience sand, gravel, and related operations. Expert, federal and state taxes, cost control, office management. Settled family man, age 36. Available 30 days notice.

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WANTED

7′ or 8′ by 20′—24′ tube mill. State best price and location for inspection.

Box No. M 3, c/o Pit and Quarry Publications
538 So. Clark St. Chicago 5, Illinois

WANTED

30 x 48 double roll Crusher or larger.

BALLEW AND ROBERTS CONSTRUCTION CO.
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But Construction Equipment that is too BIG or too SMALL doesn't look good on your job-cost sheet. RENT the RIGHT SIZE from E.C.A.

CRAWLER CRANES, DRAGLINES AND SHOVELS

1—2¼ yd. Mdl. K570 Link Belt Diesel Crawler Crane #2215, with 50-65-70 or 85' boom and 17'6" jib, high gantry, hydraulic controls, D17000 engine. Will handle 47½ ton. Weight 148,000#.

1—1⅜ yd. Link Belt Model K370, Ser. No. 2247, equipped with 70' boom, powered by Cat. D13000 Diesel engine.

1—1⅜ yd. Lorain Model 80, No. 10750, with 65' boom, powered by Waukesha Hesselman diesel engine.

1—1¼ yd. P&H Model 655-A, dragline and crane, Ser. 6426, powered by Caterpillar Model D13000 Diesel engine.

1—1⅛ yd. Link Belt Model K360, Ser. No. 1959, powered by Caterpillar D13000 Diesel engine with 65' boom. Also have back hoe attachment, boom 25' scoop arm 8/9", pull shovel mast 11'9", with 1⅛ yd. dipper.

2—1¼ yd. Lorain, Mdl. 78, Ser. #11281, 10973, power Cat. D13000 diesel engines. 70 and 100' booms.

1—1¼ yd. Bucyrus Erie, Model 33B, Ser. No. 16502, gas powered, 50' boom.

1—1¼ yd. Link Belt Model K38 crawler crane, Ser. No. 1520. Powered with 4 cyl. Model WL-51-B Waukesha gasoline engine with 50' boom.

1—1 yd. Erie Gas-Air Model GA-2 combination shovel and crane, Ser. No. 10679, powered with 4 cyl. Waukesha Model WL55 gasoline engine, with 47' crane boom. Shovel boom 22', sticks 17' with 1 yd. dipper.

1—¾ yd. Koehring Model 301, Ser. No. 81 Powered by 4 cyl. Wisconsin Model M gasoline engine with 40' boom.

2—⅜ yd. P&H, Mdl. 255A, Ser. #8243 & 5750, with Chrysler & Waukesha engines, 40' booms.

WE OWN IS CRANES NOT SHOWN ON THIS LIST. SEVERAL CRANES LISTED ARE IN OUR RENTAL DEPT. ONLY.

DERRICKS

1—30 ton Wiley brand new all steel stiffleg derricks, Model F, 60' boom, 32' mast, 37'3⅝" stiffleggs, 27' sills, 12' bullwheel, complete with blocks. Rated 30 tons at 38' radius.

1—20 ton American Bridge Co. stiffleg derrick, 36' mast, 95' boom.

2—20 ton American all steel guy derricks Model 2—100, Ser. Nos. 1341 and 1342, with 122' mast, 100' boom. Like new.

1—10 ton American Terry stiffleg derrick, 30' mast, 75' boom.

AIR COMPRESSORS

Portable and stationary, electric diesel & gasoline power, sizes from 2 cu. ft., 1,000 cu. ft.

CAR PULLERS

2—Stephen Adamson car pullers, size 999A & 14H. Both 10 H.P. 1—10,000# L.P. 1—5,000 #L.P.

EARTH DRILLS

2—Buda-Hubron drills, #1537, 1419, Mdl. H.B.E. 1, gas powered, 24" helix, 16' drill tower. NEW 1947.

LOCOMOTIVE

1—15 ton Vulcan std. ga. locomotive. Ser. No. 3903. With special MCB couplings. Powered by 6 cyl. Leiloi Mdl. JM8 gasoline engine. Equipped with 4-wheel air operated brakes with 2 cyl. Westinghouse air compressor. Complete with starter and generator.

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All this equipment is owned by us and may be inspected at one of our plants.

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Suburb of Philadelphia
Phone MAdison 6-2200

PITTSBURGH 30, PA.
P. O. Box 933-P
Phone FEderal 1-2000

NEW YORK 7, N. Y.
Dept. PQ
Phone Worth 2-0004
30-P Church St.

EQUIPMENT CORPORATION of AMERICA

ACME SPECIAL BARGAINS

P&H "Model 300" Crawler Gas Combination Backhoe, Crane and Dragline, capacity, ¼ yd., just overhauled.

Browning Truck Crane on White 1935 Truck, pneumatic tires, capacity, ¾ yd.

8-ton Huber 3-wheel Gas Roller.

THE ACME EQUIPMENT COMPANY
14057 Schaefer Hgy., Detroit 27, Mich.
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FOR SALE
G. I. SURPLUS TRUCKS

K-8 INTERNATIONAL'S in excellent condition, very low mileage.
GMC's 6x6's, CHEV 4x4's, Jeeps.
25 T. Tandem LOW-BOY TRAILERS.
Used dump bodies, all sizes.
WINCHES
For complete information, phone, write or wire us.

JOHNSON MOTORS
Bettendorf, Iowa
Phone day or nite.
Davenport 3-2766 or 3-2767

FOR SALE

365 ft. New Thermoid 1" I.D. 3-Braid Neoprene Air Hose, $175.00.

22 ft. 30" new 5-ply conveyor belting, $85.00.

3 new Barber-Greene 30" conveyor troughing rollers, $25.00 each.

1 new 24" automatic reciprocating plate feeder (for base of 18" or 24" conveyor) $390.

1 15 x 24 AW R.B. Crusher with I.H.C. UD 14 diesel engine V-belt drive 32 ft. bucket folding elevator, 20 yard single compartment bin, crushed about 2500 tons. $7500.00.

1 AW 9 x 40 R.B. crusher used about 90 days. $3500.00.

WESTERN EQUIPMENT & SUPPLY COMPANY
Rock Island, Illinois
Tel. Rock Island 8-6319

Equipment Values!

Backhoe Shovel—Lorain L-30, serial #3047I, with Cat Diesel D18 eng., 40" backhoe, 11 ft. crawlers w/2-speed 30" treads. Used 400 hours. FOB Louisville.....$21,500.00

Tractor-Dozer—Caterpillar Diesel D6, #8U1807, w/new Cat. #24 CCU and nose piece. Southwest angledozer. Eight months old. FOB Paducah, Ky.....$7650.00

Engine-Power Unit — Caterpillar Diesel D13000Y, #8S4170SP, outboard bearing. Run only 800 hours since it was completely reconditioned. FOB Paducah, Ky.....$3750.00

Tractor-Dozer—Allis-Chalmers Diesel HD14; wide gauge, w/Gar Wood hyd. dozer. Checked over, cleaned, painted. A good value. FOB Louisville.....$4250.00

Tractor-Dozer — Caterpillar Diesel D7, #5T39SP, w/LaPlant-Choate angledozer, Cat. #25 CCU, crankcase guard, pull hook. Just out of our shop where it was completely gone over. FOB Louisville.....$8950.00

Generator — Buda Diesel, #14365, 25 KW, 220/440 volts, powered by Buda 65 HP Diesel eng., Century generator, G.E. voltage regulator. FOB Louisville.....$1750.00

ROY C. WHAYNE SUPPLY CO.
800 W. MAIN ST. • LOUISVILLE, KY.
Evansville, Ind. Paducah, Ky.

FOR SALE

1000 Ton Asphalt Plant
15" Hydraulic Dredge
Gravel & Washing Plants
60 Ton Single Compt. Bins
Locomotives and Railroad Cars
30 Ton Capy. Whirleys, Steam
200 to 500 Brl. Cement Bins
15 Ton Northwest Truck Crane $6500
Cranes, Crawler & Loco., all sizes
100 Ton Capy. Derrick Scow

"STONE THE CRANE MAN"
1132 Prudential Bldg.
Buffalo 2, N. Y.
Phone MOhawk 4494

FOR SALE

Barber-Greene Gravel Plant complete with 36" conveyor system, 12"x40" roller bearing jaw crusher, 22"x22" roller bearing roll crusher, 3½'x9' double deck screen with 150 H.P. diesel motor, mounted on pneumatic tires. In excellent condition.

JAMES W. BELL CO., INC.
Cedar Rapids, Ia.

FALL CLEARANCE SALE

Rex "27-E" Paver—ready to work	$8250.00
Blaw-Knox 3-yd. Hor. Truck Mixers w/Trucks, each	1250.00
Henke "70" Maintainer 10' Blade, Demonstrator	1985.00
LaPlant-Choate "C-44" 4 yard Scraper w/hydraulics, new	2995.00
Bucyrus-Erie "S-67" 6-8 yd. used Scraper	2000.00
International "TD-12" Diesel Tractor w/Dozer	4500.00
Cletrac 240D" Diesel Tractor w/Dozer	2250.00
A-C "HD-7" Diesel Tractor w/Dozer	4500.00
Unit ½ yard Shovel, 3 years old	6000.00
Universal #3 Rebuilt 18 x 31 Pulverizer	1750.00
Gibson 14" Used Pulverizer	350.00
Gibson 18" Used Pulverizer	500.00

Many other items — all available for inspection at our Rockford location.

EIGHMY EQUIPMENT COMPANY
Pierpont at West State Street **Rockford, Illinois**
Phone 4-6706

L.B.SMITH INC.
OFFERS

AIR COMPRESSORS

2 Gardner-Denver 500 cu. ft., 2-stage water-cooled. Caterpillar D13000 on four pneumatic tires. Practically new.

LeRoi 2-stage 105 cubic foot air-cooled, skid mounted, built-in tool boxes, hose reels and hose.

Gardner-Denver air-cooled 105 foot with receiver, V-Belt driven from power take-off and mounted on 1942 Ford chassis with Wood two-yard dump body.

Gardner-Denver two-stage 160 ft., skid mounted.

Worthington 210 cubic foot, two-stage air-cooled, on skid base with Hercules diesel.

Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven, 50 HP slip ring motor.

Worthington two-stage, water cooled, vertical 250#, 60 CFM, new condition.

BELT CONVEYORS
New 18" — 24" — 30" — 36"

SHOVELS & CRANES

Lorain 75B, 1¼-yd. shovel, diesel power.

P&H 625A 15-ton crawler crane.

Marion 25-ton diesel powered heavy duty truck crane on heavily reinforced Mack.

Brownhoist 1-yd. gas shovel and crane.

Lorain 30 combination ½-yd. shovel, hoe & clam.

P&H Model 150 ½-yd. truck crane on 6x4 Mack.

QUARRY EQUIPMENT & BINS

1036 Cedarapids. New condition.
10 x 7 Allis Chalmers Blake type jaw crusher.
60 ton 2 compartment storage bin with clam shell gates.
Cedarapids No. 1 Kubit
Cedarapids BBB scalping unit w/1036 jaw.
1020 Beaumont

MISCELLANEOUS

Barber-Greene 44C Trenching Machine.
Warco D76 grader. International UD14A diesel
½-yd. to 2-yd. clamshell buckets.
½-yd. to 5-yd. dragline buckets.
6-yd. and 12-yd. Sauerman buckets.

TRUCKS — TRAILERS

1½-ton Ford & Chevrolet.
2½-ton GMC. New and rebuilt.
Sterling COE Model 255GCS tande m drive tractor. 200 HP Cummins supercharged diesel, excel. cond.
40-ton Rogers low bed equipment trailer, air-brakes, outriggers, excel. cond.
2,000 gallon tanks on semi-trailer mounting.
New and rebuilt dump bodies.

GASOLINE AND DIESEL ENGINES

New IXD Hercules gasoline.
New and used Murphy 4-cylinder diesel.
GMC 6 and 12 cylinder. Practically new.
Buda, Hercules, Hill, rebuilt.

GENERATORS & LIGHT PLANTS

1½ KW to 125 KW, alternating and direct current, gasoline and diesel powered.

Phone **HARRISBURG, PA. 7-3431**

LASTING • BONAFIDE • SERVICE — L.B. SMITH, INC.

L.B.SMITH INC. CAMP HILL, PA. SUBURB OF HARRISBURG

WE OWN THE EQUIPMENT WE ADVERTISE

FOR SALE

2—219 KVA 3 ph. 60 cycle 480 V, 514 RPM Generators dir. con.
2—275 HP 8 cyl 9" x 10½" vert. Atlas Imp. Diesel Eng. w/sw. brd. & exctrs.
2—4' Symons Cone Crushers Fine Bowl Std. Hd. w/2 100 HP, 490 RPM Slip Ring motors, controllers and couplings.
1—3' Symons Cone Std. Hd. Coarse & Fine Bowl Extra mantle.
1—28" x 36" Webb City Blake Type Crusher.
1—2'4" Traylor TY Red-Crusher.
1—8B Telsmith 30 TPH.
1—10B Telsmith 36 TPH.
1—1200 cu. ft. IR Air Compr.
1—55' x 12' Harding Thickener Mech. steel spr. str.
4' x 2' Denver Drum Filter complete.
50 HP DD Mine Hoist.
50 HP SD Mine Hoist

PACIFIC MACHINERY & ENGINEERING CO.
420 Market Street
San Francisco 5, Calif. Phone SUtter 1-3943

LIQUIDATIONS!

3—Oliver 11'6"x18' Rotary Filters
2—Vulcan 9'x120' Rotary Kilns
2—Link Belt 7'x45' Rotary Kilns
1—Ronnot 6'x19' Rotary Kiln
1—Rotary Dryer 6'x50'
1—Ronnot 3'x35' Rotary Cooler
3—Raymond 3-roll, 5-roll Mills
3—Rotex Screens, 40"x120"
4—Tyler Screens, 3'x5', 4'x5', 4'x10'
1—Traylor 5'x10' Rod Mill
1—Marcy 7'x16' Rod Mill
2—Hardinge Ball Mills, 8'x22", 5'x26"
1—Patterson Ball Mill 6'x16'
1—Patterson 3'x10' Ball Mill
1—Ronnot 5'x22' silex-lined Tube Mill
1—Jeffrey 20"x12" Hammer Mill
1—Dixie 3656 Hammer Mill
1—Farrel 26"x24" Jaw Crusher
1—Blake 10"x18" Jaw Crusher
20—Bucket & Redler Conveyors
500'—Screw Conveyor, 12" and 16"
3—Traylor 36", 54" Slurry Bucket Wheel Feeders
75—Centrifugal Pumps 1" to 16"
8—Dorr Thickener Tanks 55'x48', 40'x25', 40'x15'

PARTIAL LIST

SEND FOR NEWS FLASH

BRILL EQUIPMENT COMPANY
2401 Third Avenue, New York 51, N. Y.

FOR SALE

Link Belt enclosed vibr. screen, 3'x8'
Simplicity single deck 6'x8' scalping screen
Leahy single deck 4'x8' vibrating screens
Enclosed single deck 3'x5' Hummer vib. screens
New single and double deck Universal vibr. screens
Magnetic separators and pulleys
Cont. 12" bucket elevator on chain 50'
Perfect Discharge 12" bucket elevator 75'
20—Inclined and vertical elevators 4" to 16" buckets
Enclosed elevators, centrifugal discharge and cont.
Standard elevator chain and sprockets and buckets
Thimble steel roller chain, 6" and 9" pitch
Portable conveyors, 18"x24', electric
Apron conveyors: 24" and 36" wide
8" Cont. bucket elevator 37' enclosed
Trough idlers for 30" and 36" belt, Timken
16" and 18" new trough and flat idlers
Conveyor pulleys, belt and idlers
Screw and gravity conveyors
V pulleys, gears, sprockets, drive pulleys
I-R centr. pump 8", 2000 gpm 188' head
I-R centr. pump 6", 1000 gpm 288' head
2" Homelite pump, gasoline
Feeders for conveyors and elevators
Ten ton overhead 20' span electric crane
Ing. Rand new 10,000 lb. airhoist on trolleys
Box & barrel elevator, 24' 500 lb. electric
Speed reducers 79 hp to ½ hp.
Reeves drive and variable speed motors
Slip Ring motors 25 and 15 hp
1½ yd. Lakewood clamshell buckets
Air tanks 30"x6'
Good Roads 10x20 jaw crusher
Buchanan B 10"x16" jaw crusher
Reliance 13"x24" jaw crusher
Heavy duty double roll crusher 18"x28"
S-A 18" KNITTEL crusher, anti-friction bearings
Jeffrey single roll coal crusher, 18"x18"
Bin gates: 12"x12", 15"x15", 20"x20" duplex

G. A. UNVERZAGT & SONS
136 Colt Street Irvington, N. J.

AIR COMPRESSOR

3078 CFM at 110 PSI

Ingersoll Rand Type PRE-2, 30x18x21, Direct Connected to

500 HP GE SYNCH. MOTOR

3/60/2200 VOLT EXCITATION AND PANEL

USED ONLY 6 MONTHS

HEAT AND POWER CO., INC.
70 PINE STREET Digby 8-0373 NEW YORK 5, N. Y.

USED EQUIPMENT FOR SALE

1—¾ Yd. Shovel, Model 3 Northwest Caterpillar. Year Model 1929—Serial #2966. Powered with Wisconsin Gas Engine. Condition: Good — Motor Overhauled 1949. Price: $4,000.00.

2—Shovel Fronts for ¾ Yd. Bucyrus-Erie Type B Steam Shovels. Booms, Sticks & Dippers. Condition: Excellent. Price: $500.00 each.

3—Air Cooled Motors, Wisconsin VF4. Including Drives. Used 4 months. Price: $200.00 each.

1—Speed Reducer, Model 9DA Falk. 100 H.P. Complete with Couplings. Ratio 11.5 to 1. Shaft Dia.—Input 2", Output 5". Condition: Excellent. Price: $1,000.00.

1—Electric Converter, Model FCE8 Reliance. 1½ H.P.—8 KVA—440 V. —60 Cy.—3 Phase. Condition: Good. Price $350.00.

1—Air Compressor, 220 ft. Ingersoll-Rand Single Stage. Mounted on International Truck Chassis. Condition: Compressor & Truck — Complete Unit—Good. Price: $1,000.00.

1—Draft Fan, Model 55 CWHBD American Blower Type E. Condition: Good. Price: $200.00.

1—Roll Crusher, Martin 18" Style F. Condition: Good. Price: $400.00.

1—Sectional Belt Conveyor—Farquhar #346, 14" x 17' with Motor, Hopper & Discharge Chute. Condition: Good. Price: $200.00.

1—Well Drill, Bucyrus Erie Model 27T Blast Hole. Gasoline Powered. Condition: Excellent. Price: $6,500.00.

2—Well Drills, Loomis Model 44 Clipper Full Crawler Blast Hole. Gasoline Powered. Condition: Excellent. Price: $4,500.00 each.

1—Well Drill, Loomis Model 44 Clipper Half Track Blast Hole. Diesel Powered. Condition: Good. Price: $1,000.00.

1—Well Drill, Loomis Model 1½ Clipper Blast Hole, Non-Traction. Diesel Powered. Condition: Good. Price: $1,000.00.

1—Well Drill, Loomis Model 44 Clipper Blast Hole, Non-Traction. Diesel Powered. Condition: Good. Price: $1,000.00.

1—Screen, Tyler Niagara 18" x 4' Type 100. 1 Surface #8269. Condition: Good. Price: $200.00.

1—Scale, Exact Weight Style #2225, 10# Tare Beam, Dial 25#. Under 5# Over with Dustite Bagholder. Condition: Good. Price: $200.00.

THOMASVILLE STONE AND LIME COMPANY
THOMASVILLE, PA.

SPECIAL OFFERING

1—new 18 x 32 solid steel frame style D crusher.

1—new 14 x 26 solid steel frame jaw crusher.

1—#6 McCully crusher in good running condition just taken from service.

2—6' dia. 12 x 16' long scalping screens 2¼" manganese perforations.

A number of new manganese steel screen sections for Allis Chalmers 6' revolving screens 2¼" perforations.

New and rebuilt jaw crushers in all sizes from 6 x 10 to 42 x 60.

ACME ROAD MACHINERY COMPANY — Frankfort, New York

FOR SALE
LOCOMOTIVES

G.E. 44 Ton Diesel-Elec.—I. C. C.—Late Model.

2—Whitcomb gas, 6 ton, 24" ga.
2—Plymouth 12 Ton, Std. Ga. Gas.
1—Brookville 10 Ton Diesel, 30" Ga. Like New.
1—Porter 12 Ton Diesel, 36" Ga.
1—Plymouth 15 Ton Diesel, 36" Ga.
2—Plymouth 8 Ton, Std. Ga., Gas.

COMPRESSORS
Chi.-Pneu.—PM-4-2—#43917—445 C.F.M.—75 hp. —3/60/440—Like New.
1—Chi. Pneu. 500' Port. Diesel.
1—Chi. Pneu. 900' Port. Diesel.

DERRICKS
1—American 125 Ton S. L. 110' Boom.

MISCELLANEOUS
HYSTAWAY ATT. for D-8—Used one day.
Union #6 Hammer #2128.
Dewalt 7½ HP Electric Saw—Like New.
28—Western 20 yd. Air Dump.

LOCOMOTIVE CRANES
Browning 30 ton Steam—New 1940—#3085.

R. H. BOYER
2005-13 W. Bellevue St., Philadelphia 40, Pa.
Phone—SA-2-7132

FOR SALE

Sand pump, 4 inch, N. J. Sand & Gravel.

Screens, 4' x 12' double deck positive drive Link Belt

Bagger, with scale, bagholder, complete. Exact Weight Scale Co.

Screw conveyor 6" dia., 44" long, with 32" x 20" x 15" high hopper integral.

Elevator, enclosed, chain, 5' centers, 6" x 3" buckets, with drive.

Elevator, enclosed, chain, 13½' centers, approx. 10" x 6" buckets, with drive.

Pulley, flat, wood face, steel hub & spokes, 72" dia., 20" face, for 6⅜" shaft.

Buckets, elevator, light steel, 5" x 14" and 5" x 7".

M. S. Wright III
Box 126, Old Bridge, N. J.

OFFERING FOR SALE

4—25 yd. Maxie Dumps, rock beds, 3 axle, 1400 x 24 tires.
2—Mack Bulldog rock dumps, 2 axle, 1200 x 24 tires, one with Cummins Diesel.
1—Traylor Finishing Crusher, 6" Bulldog type BH.
1—125 HP Atlas Imperial Diesel.
2—Erie Type B ¾ yd. Steamers, 1 yd. shovel fronts.

OSBORN COMPANY
3200 Edgecliff Lane, Pasadena 8, Cal.
Phone: SYcamore 6-7141

EMERGENCY GENERATORS GASOLINE-DIESEL

From 1 to 1,000 kw.

MIDWEST UTILITIES POWER EQUIP. CORP.
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Phone EVerglade 4-4511

RELAYING RAIL

TRACK ACCESSORIES

Midwest Steel Corporation
CHARLESTON 21, W. VA.
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N. W. Model 6—1¼ yd.—N. W. Model 80—2 yd. Lima 1201 Cummins engine—3 cu. yd. Shovels—⅝ yd. combination—others.
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Complete crushing plant including 42" x 36" Jaw—others.
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400	*Al. Ch.	ANW	900
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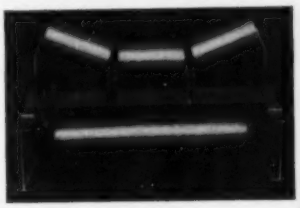

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5'x22", 6'x22", 6'x18", 8'x22" & 8'x36" Hardinge Conical Ball Mills.
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One model 43 B Bucyrus Shovel completely rebuilt with new model 6DC-1125 Buda diesel engine and new 2 cu. yd. Esco all manganese rock dipper, available immediately.

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Heavy-duty, smooth bore, wire inserted Suction Hose. Flexible and strong. For use in mines, sewers, trenches, etc. with diaphragm pumps, pressure pumps and other contractors equipment. Prices shown include I.P.T. Couplings attached to each length.

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1½"x15 ft.	7.50 √	3"x20 ft.	47.50
1½"x20 ft.	10.00 √	*4"x10 ft.	25.00 √
1½"x10 ft.	6.50 √	*4"x20 ft.	68.00
1½"x15 ft.	9.00 √	*5"x15 ft.	53.00 √
1½"x20 ft.	14.00 √	*5"x30 ft.	90.00 √
2"x10 ft.	12.00 √	*6"x10 ft.	90.00
2"x15 ft.	22.75	*6"x15 ft.	126.00
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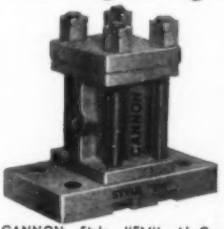

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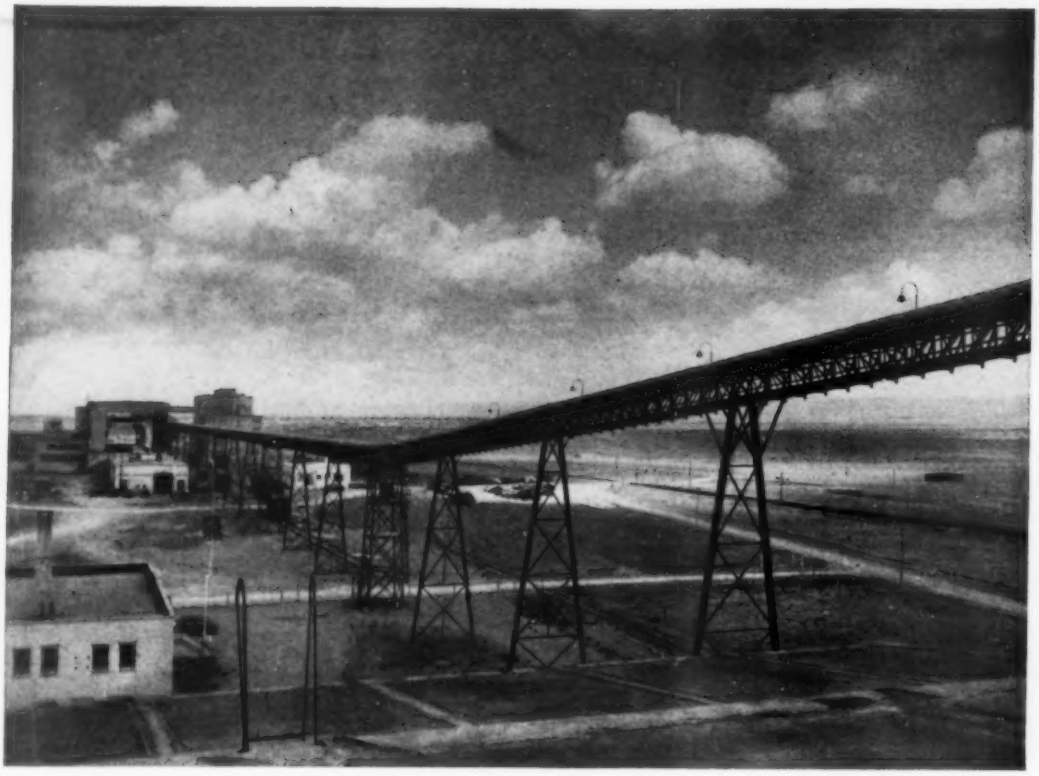

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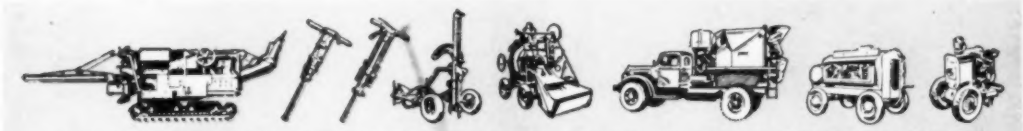

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